January 1989

MODEL AIRPLANE NEWS

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Editorial

by RICH URAVITCH

I'M SURE THERE ARE a few "seasoned" modelers out there who just might recognize this month's cover, reprinted as it first appeared in January 1929. The exuberance displayed by this young modeler tells the whole story. This issue represents an incredible publishing milestone, as we're entering our sixtieth year of publication. We're proud of our heritage and thank you, the modelers who have made it all happen.

It's that time of year again, folks. Just about the time you're reading this, some of our more northern readers will be looking out the window, watching the snow fall and probably adding a pair of skis to their favorite sport airplane. I plan on doing that very thing myself this season. Regardless of where you're located, even if there's sand instead of snow, it's the time of the year we call the holiday season. All of the Christmas "wish lists" are probably in the works, if not already completed. Wives and moms are scurrying around making sure their favorite hobby supplier has all the things their favorite modeler has "hinted around" about. Truth be known, a lot of them are probably on a first-name basis with the guy at the local hobby shop; it's where they call with the reminder to make one extra stop on the way home for bread, milk and other "un-hobby" items.

In addition to being the time of year for gift giving and receiving, it's usually the time when we make "resolutions" for the new year, many of which last until about January 3. When we think about the resolutions we'd like to make, we usually engage in some sort of retrospection that often gives us a handle on what we'd like *not* to do over. Let's look at things a little differently... what is it that we *haven't* done that we should, or would like to do? Don't overwhelm yourself; decide on one or two positive things and *do* them.

Looking for suggestions? Something worthwhile? Let me offer a few: How about taking a new modeler under your wing? Teach him or her something about our hobby that brings us so much enjoyment. Don't complain about scratch-building being a "dying art." If you're good at it and enjoy it, pass it on so someone else can keep it going. It can only die if no one cares about its survival. Organize something in your club: a mall show, a fly-in, a joint function with a civic group. Be proud of your hobby. Participate in your sport. We don't get the recognition we deserve, because we're reluctant to throw out our chests and tell people what our favorite leisure-time activity is. Does it take any less skill to fly one of our airplanes or helicopters than to play pool, golf, drive a boat, hunt or fish? I doubt it! The bottom line is, our sport has an image problem, and that problem is one of *non*-image! Even the weekend "survivalists" have an image: You may not like it, but when they suit up in "camo" and set out to shoot paint bullets at one another, there's no question as to what they're into.

Pick up the challenge. Do whatever *you* can to promote aeromodeling, or we may eventually end up on a boat on a lake in the middle of a golf course shooting paint bullets at one another!

The entire Air Age team wishes you the happiest of holidays and a productive and prosperous new year! ■

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Airwaves

WHERE TO WRITE TO US

If you're writing to the editors (and we'd love to hear from you), please be sure to address your letters to "Airwaves" *Model Airplane News*, 251 Danbury Road, Wilton, CT 06897. Only subscription orders and inquiries are handled by our Customer Service Department in Mount Morris, IL; other mail addressed there must be forwarded to Connecticut, and this leads to long delays.

Plans Collector Position

I have been a model airplane builder for approximately 52 years and an airplane pilot for 43 years. My main interest is radio-control scale of the '30s. I enjoy scratch-building, including drawing the plans. I have a collection of plans that I've cut from model magazines dating back to the late '30s.

Now, my complaint: I was extremely disappointed in your September issue of *Model Airplane News*, in that only partial plans were published of the SB2U-1. Your publication has been nearly perfect until this issue, and I have been reading it since the early '40s.

Here's hoping that, in the future, you'll publish complete plans.

R.S. KEETON, JR.
Louisville, KY

Mr. Keeton, we decided to present the Vindicator in that manner because we still believe our obligation to the reader is to present a well-rounded, broad-interest publication. "Doc" Keith did such an outstanding, detailed and thorough job on the article that presenting all *the drawings, text and photography would have consumed a huge piece of the magazine. As a result, we have prepared a separate construction manual, which is sent with every three-sheet plans package.*

This approach may occasionally be employed when projects of this nature are to be presented, and we hope you, and other readers with similar feelings, understand.

RAU

Go Ahead; Make My Day!!

I wonder how many loyal readers you have who have been faithfully getting your magazine since one of the earliest issues of about 1929. I used to haunt the newsstands at the expected issue date and hoard my nickels and dimes to buy it then. I avidly read C.H. Grant and built Howard McEntee's great models from your plans (PZL-1, Curtiss Shrike A-8, etc.).

"You've come a long way, baby"—and now I only vicariously get the thrill of building and flying by reading and studying your publication.

MAX MUNK
Northridge, CA

Mr. Munk, we have a lot of readers who tell us they've been reading MAN *for a long time. It's the readers, like you, who take the time to tell us they're still reading* MAN *who make producing each issue that much more enjoyable. We've "come*

a long way," but haven't forgotten from where. Thanks.

RAU

No One Ever *Really* "Quits the Hobby!"

After some 40 years of being away from the hobby, I "came back" about three years ago, shortly before my heart attack and subsequent bypass surgery. Needless to say, now that I don't play as much golf as I used to, the hobby has been a blessing, as it keeps me off the streets and away from bad booze and fast women!

The picture enclosed is of my newest plane, and I'm quite proud of it. It's a Dave Platt kit of the Supermarine Spitfire; 1/5 scale and a total joy to build. It took me about 12 months to build, and I loved every minute of it. It's completely scale (the best I could do), weighs in at

22 pounds (including the 5 pounds of lead in the nose to balance it), and, powered with an ST-2500, it flies like a homesick angel with the 18/6 prop I have on it. It has Dave Platt retracts and an Avco cockpit. This cockpit leaves much to be desired, but I understand there's a new one on the market that's much better.

When I came back to the hobby, I couldn't believe the strides taken since I'd left, and I felt like I was learning all over again.

I crashed a Curtis Robin through a case of being "head up and locked." It was a plane that never would have crashed otherwise!

I've just started a Stinson SR-9, using Barron plans and a Klarich "short kit." After I finish this, I also have the complete units of the Holstettler "Wedell-Williams" Racer and the Golden Era (Lewis Pancoast), and plans for the 1/4-scale Grumman "Gulfhawk" (Al Williams). By the time I get to this one, I hope to be building well enough to entertain thoughts of entering some of the contests with the "big boys."

E.W. NESS
Columbia, SC

Mr. Ness, welcome back! Your Spitfire looks great; you may be ready for the "big boys" right now! Check out our Scale Masters coverage in this issue. See what I mean?

Send us some photos of the completed Gulfhawk.

RAU

(Continued on page 10)

Airwaves

Model *Airship* News, Again?

In "Airwaves" of our August '88 issue, we put out a call for information concerning R/C airships for some of our readers who had inquired.

Karlo Eisele from Koblenz, W. Germany, informs us that: "There are some modelers who have built and flown successfully semi full-scale airships. One of them has also written a book: 'RC-Ballone und Luftschiffe' by K.L. Busemeyer, printed by Neckar-Verlag, Modell-Buchreihe, D 7730 Villingen-Schwenningen, P.O. Box 1820, W. Germany."

Thanks Karlo, anybody else have additional info?

RAU

What's Next? Miniature FBOs?

Here's my scale (more or less) Bollnas BT A-20 aircraft tractor towing my scale (more or less) Stinson Reliant SR-6, posing with a full-size Porterfield (1940 vintage). Ground photos were taken at our club's flying field, Wamplers Lake Airfield, Brooklyn, MI, and we fly as the Irish Hills R/C Club.

The towing tractor is on a Nikko 4x4 R/C car chassis (heavily modified), while the tow-bar origin is easily recognized. The tractor is underpowered for this job, as the Stinson weighs 8 pounds. The plane is a J. Roberts kit, 62-inch span, finished in cloth and lacquer, and marginally powered with an O.S. .48 Surpass.

Plane is flown on wheels and floats with 60-degree flaps by Jim Clark of our club.

JIM SWINGHAMMER
Brooklyn, MI

No More Ultra?

I'm interested in building an R/C ultralight. Unfortunately, I've found no plans or kits available. I remember that a few years back, Cox was producing an ultralight, but that's no longer so. Also, there were plans for full-size ultralights in the classified section of a few aircraft magazines, but those have vanished, too. Can you help?

BRIAN WEST
Huntington Beach, CA

Brian, you've come to the right—even ultraright—place. The Cox machine, as you have already pointed out, is no longer readily available. Same story, I think, for the more recent Kyosho and Carlberg offerings. There is hope, though; our Woodhopper (plan No. 1842, $19) should fill the bill. It's ¼ scale, uses a .40 engine, and is built from balsa and aluminum.

RAU

Clarence Lee Writing to *MAN?*

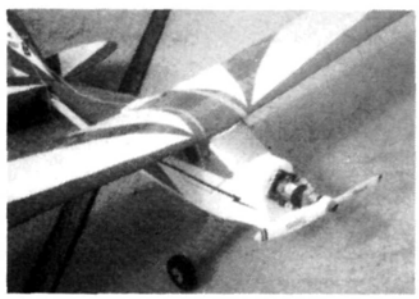
In the October "Airwaves," a Col. Harry Howton asked for a source of desk-top models. Here's another source, if you still have his address around.

CLARENCE LEE

Clarence sent an illustrated brochure from Boomerang Publishers, 6164 W. 83rd Way, Arvada, CO 80003. In addition to desk-top models, they have all kinds of airplane-related jewelry, T-shirts, patches and hats.

And I thought Clarence was sending some engine tips....

RAU



Reader Report Repeat Response

Since you were so kind as to publish my remarks on the Great Planes Electri-CUB in the April '88 magazine, I feel that I owe you a follow-up letter. I have greatly enjoyed the "Reader Reports," and the fine articles by John Lupperger on "Quiet Flight."

My final comment on the Electri-CUB was that I wondered how it would

(Continued on page 12)

Airwaves

fly with an Astro-Flight Cobalt.

Well, the enclosed pictures show my installation of a geared 05 Cobalt with a 11-6 Tornado propeller mounted in a J'Tec universal mount. The performance is now more like that of a scared rabbit and, I'm sure, comparable with that obtained with a .10 two-cycle gas engine.

Keep up the good format and newsy articles, and try for another 59 years.

ROBERT D. GILSON
Palm Coast, FL

Thanks Bob, we'll try another 59 years if you'll continue participating!

RAU

Mini-Scale Dragnet

I just finished reading the September issue of your fine magazine, and I want to compliment you for doing a great job. It's refreshing to read a model magazine that's more than a catalog!

My favorite column is "Small Steps," and I hope it continues, as the small plane continues to be a challenge. The coverage of the ⅛ Air Force contest really was great. I was particularly taken with Buzz Watson's baby P-47. I would like to see a feature on this man and his special small-model skills. I realize this is a very special effort, and a model of this quality is not for everyone who builds small planes.

You'd be doing us small-plane modelers a real service if you could answer some questions, such as the radio used, kit or scratch-built, lightening techniques, finish, etc.

STEVE TISCHLER
Lake Oswego, OR

Steve, sounds like a great idea to me. Since the interest in smaller airplanes is really growing, we'll try to track Buzz down and have him put something together. Apparently, he does a lot of this, because I remember a similar SBD Dauntless he did a while ago.

OK, trusted deputies, help us round up Buzz!

RAU

We welcome your comments, opinions, and suggestions. Letters should be addressed to "Airwaves," **Model Airplane News**, 251 Danbury Rd., Wilton, CT 06897. Letters may be edited for clarity and length.

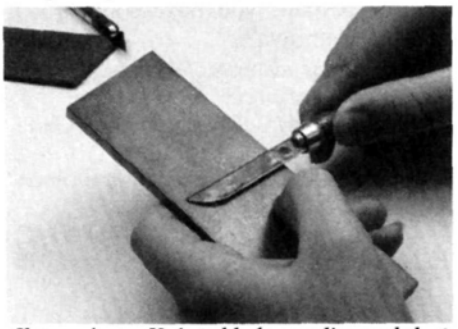
Building Model Airplanes *Cutting Tools*

by JOE WAGNER

THE PRIMARY KEY to success in building model airplanes is a simple one: really sharp tools. It may seem like a paradox, but the softer the wood, the keener the cutting edge needs to be for shaping it. When working with balsa, if your blade isn't sufficiently sharp, it won't slice cleanly; the wood either crushes ahead of the tool, or it splits along the grain. But a genuinely sharp-edged blade makes easy work of balsa cutting.

Blade Sharpening

X-Acto knives and their clones are the most common model-builders' cutting tools, and you can make sure that they're always sharp by replacing their blades frequently. However, I think it's even



Sharpening an X-Acto blade on a diamond-dust hone is quick, clean and easy. In the background is a Peck-Polymer's Sharpy—an inexpensive yet effective blade-sharpening tool.

better to *re-sharpen* them. I've been doing that myself for years, and can't remember when I last had to buy a new pack of X-Acto blades.

Sharpening knife edges isn't at all difficult. It's a highly convenient skill to have when your X-Acto plane or spokeshave begins to dig into the wood instead of slicing it cleanly. And when you sharpen your own blades, you can make their edges even keener than they were when new.

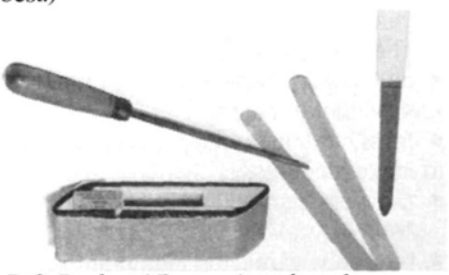
For years, I used oilstones to sharpen my cutting tools; they worked well, but they were messy. Oilstones need to be flooded with light machine oil to prevent their surfaces from wearing away or becoming clogged with metal particles, so after each sharpening session, I had to spend time cleaning the oil off the blade and the stone. Thus, when a blade started showing signs of dullness, I didn't always sharpen it right away. I'd put up with it until it was really bad—and that's not good!

Now, however, I have two new blade-sharpening items that are used completely dry. Because there's no mess to clean up, I immediately sharpen my cutting tools as soon as they show a reluctance to cut. My model building goes a lot more easily, these days!

For re-edging a knife blade or plane blade, I have a 2x6-inch diamond-dust hone, which I bought mail-order (for about $30) from Leichtung*. It cuts much faster than any oilstone of equivalent grit, and it will last just about forever. Using it is easy: Following the instruction sheet, I merely stroke the blade across the hone as if I were trying to cut off a very thin slice of it. No great pressure on the blade is needed; just enough to ensure firm contact with the hone. A few strokes on each side is all it takes.

For a quick touch-up of a blade that's just beginning to feel dull, I use a Peck-Polymers "Sharpy" (about $2.50). This is a two-sided tool: One side has a smooth, edge-burnishing surface, and the other side is slightly coarser for a faster sharpening action.

The Sharpy comes with an instruction sheet, but one part of this needs clarification: Where it tells you to move the blade *in only one direction* while sharpening, this doesn't mean you should only go from top to bottom on the Sharpy, but merely that you should always move the blade with its cutting edge trailing. (In other words, just the opposite of the "slicing-off-a-thin-layer" technique with which the diamond-dust hone works best.)



D.G. Products' Permagrit tools make coarse- and medium-grain sandpaper just about obsolete. At left is a homemade sanding block, faced top and bottom with 2x11-inch Permagrit strips.

I keep both the diamond hone and the Sharpy handy on my workbench, where I can put them to use whenever I need them. Even in a soft material like balsa, a steel cutting edge dulls faster than you'd expect. Blade *wear* isn't so much of a problem; it's oxidation and the breaking off of minute particles from the edge that cause dulling.

A keen cutting edge is only a few molecules thick, so it doesn't take much force to break away a tiny chip, especially if the blade is of hard, brittle steel. As for oxidation, although you may not see rust forming on a razor-sharp edge, iron and oxygen chemically combine all too readily to replace the tough, thin, keen metallic edge with a soft, easily-blunted layer. That's why regular sharpening is important, if we want our cutting tools to do the precision job of shaping wood they're intended for.

The sharpest cutting edges available for model-building purposes are probably those of the old-fashioned double-edge razor blades. Because they're so thin, these blades are ideal for jobs such as hand-cutting stringer notches in fuselage

bulkheads, or cutting spar slots in wing ribs. They're hard to find these days, though; modern shaving equipment has rendered obsolete the old "safety razor" that the double-edged blades were made for. However, Jim Jones* recently found a few thousand of those old two-edgers, and he'll send you 100 of them, postpaid, for $10.

Sandpaper

Many woodworkers, even those who use sandpaper frequently, don't seem to realize that each one of its many thousands of sharp-edged particles is an individual cutting tool. When these particles are new and keen-edged, they efficiently plane off tiny chips and shavings from the surface they're working on. But they can do little more than make minuscule grooves in that surface if their sharp corners have worn off.

That's why *modelers should never:*

- buy cheap, fast-wearing sandpaper such as flint or emery;
- press hard on sandpaper in an attempt to make it cut faster;
- use worn-out sandpaper of any type.

Modelers should:

- buy only garnet or aluminum-oxide abrasive paper (preferably of the "open-coat" variety, because its particles are widely spaced to make room between them for the dust they produce);
- use only enough pressure on sandpaper to keep it in contact with the area you're shaping. Excessive force won't make it cut faster; it will only cause the abrasive grains to dull more quickly, clog up, or even tear off their backing;
- throw sandpaper away as soon as its surface begins to lose its abrasive feel. It won't cut efficiently any more, and you're wasting time and energy trying to force it to do work it's no longer capable of.

I know how difficult it is to follow this piece of advice. When you've gone to the trouble of making up several nice, professional-looking sanding blocks, it's only natural to want to keep them working as long as possible. I've done that myself all too often, even while knowing perfectly well that I'm working with dull tools that badly need replacing. That's why I'm now an enthusiastic user of D. G. Products' "Perma-Grit" abrasive tools, which consist of tungsten carbide grains bonded to a sheet-steel backing. When used with balsa, they'll never wear out, and, while they can't take over all the modeling jobs sandpaper is used for, for the all-important final shaping of edges and contours, there's nothing on the market to match them.

Model-building tools don't have to cost a lot. Useful ones shown here are manicurist's emery boards, a miniature rat-tail file (from K-Mart), and an ADC Mini-Sander.

Ace R/C, Inc.* sells the entire line of Perma-Grit tools: flat strips in two sizes (1½x9 inches and 2x11 inches) plus "round rasps" in ¼-inch, ½-inch and ¾-inch diameters, and a pair of radius-bent strips as well. They're available with coarse or fine grit, or half-and-half. After I'd tried just one of these new tools, I had to have 'em all. Now they're indispensable to my modeling equipment, and they've replaced nearly all of my old sanding blocks.

I made myself a special sanding block by epoxying a 2x11-inch Perma-Grit strip (one coarse grit, one fine) to each side of a ¾x2x11-inch piece of hardwood. I use this tool frequently for every model I build. It's ideal for sanding edges straight, contouring wing and tail leading edges, tapering ailerons; in fact, for every kind of balsa shaping that calls for slower and more precise material removal than a saw or a knife can handle. Like all the Perma-Grit tools, it's quick, accurate and never dulls.

Most rules have exceptions, and my rule to use only keen-edged tools for balsa cutting is one of them. A sharp twist drill quite often does a terrible job of making neat, precision holes in balsa wood. It digs in; it tears and shreds, instead of cutting cleanly. This may sound odd, but I've discovered that an excellent tool for making nice round holes in balsa (up to about ⅛-inch diameter), is a *square* file! I use a small needle file to put holes in balsa, twisting it between my thumb and forefinger like a drill as I push it into the wood. It never grabs into the grain as a twist drill does, and it's easy to keep centered. If I need a bigger hole than the needle file cuts, I enlarge it, as required, with a rat-tail file or a small, round wood rasp.

Let me know how my ideas work for *you*, or perhaps you have some good ideas of your own?

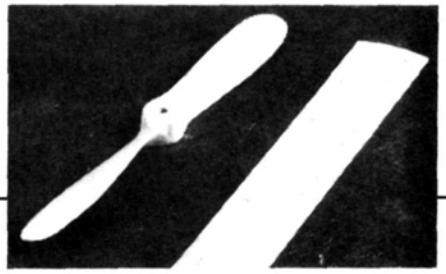
**Here are the addresses of the manufacturers mentioned in this article:*

Leichtung, 4944 Commerce Parkway, Cleveland, OH 44128.

Jim Jones, 36631 Ledgestone, Mt. Clemens, MI 48043.

Ace R/C, Inc., 116 W. 19th St., Box 511C, Higginsville, MO 64037. ■

How To:

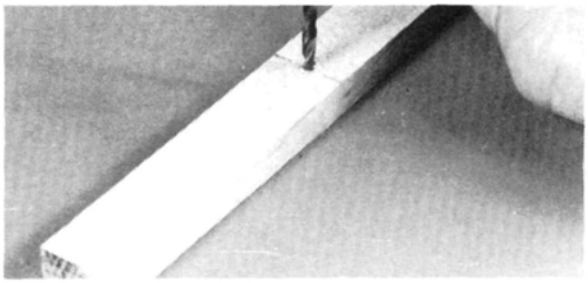


The finished prop. Custom-fit a prop to the airplane-engine combination by changing the blade shape and the thickness and taper of the blank.

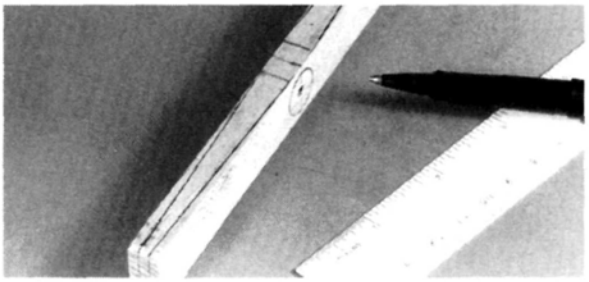
by RANDY RANDOLPH

CARVE A PROP

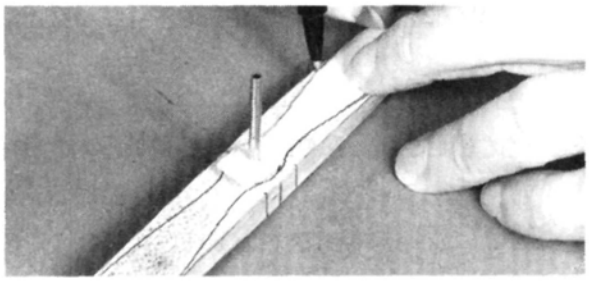
A machine to carve propellers isn't a complicated device, but the cost of such a machine far outweighs its use to the average modeler. Carving propellers with the use of a band saw, or jigsaw and a Dremel tool is an inexpensive and easy alternative. The photos show the way.



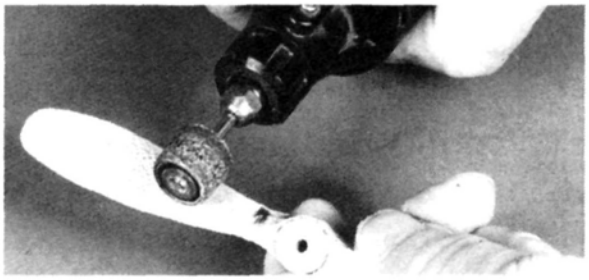
1. The first, and most difficult, step is selecting a blank. Hard woods such as birch or maple are best, but bass and pine are easier to work. (See the table of blank thickness for popular sizes.) Measure and drill the center of the blank to fit the intended prop shaft.



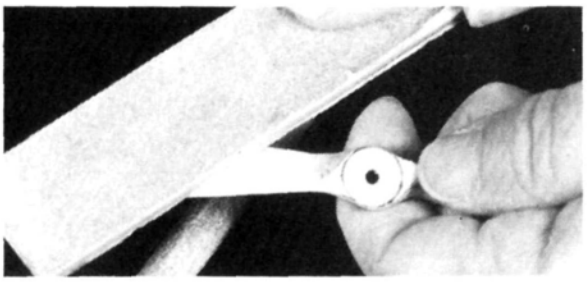
2. Mount the blank on the engine and draw around the prop washer. Mark the limits of this circle and mark the blank for tapering. This one will be a 6-inch prop with a pitch of about 3½ degrees; it measures 9/32 inch thick and tapers to 1/16 inch.



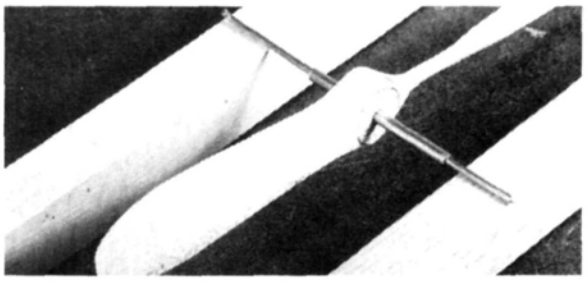
3. Taper the blank with a band saw, jigsaw or even a power sander. Make a template to mark the blade shape onto the blank. Broken commercial props make good templates! Mark the center of the blank ends as well as the template to ensure alignment. Saw the blank to shape.



4. Now for the fun part! Use the sanding drum on the Dremel tool to carve the prop to shape. The idea is to connect diagonal edges of each blade. Start with the back side at the hub and work out to the tip. The back of the blade is flat and determines the pitch. The front of the blade has a slight curve or airfoil.



5. Finish sanding the blades to shape with sanding sticks. These are 100-grit sandpaper mounted on a ruler and on a ½-inch dowel. Feel the blades for any high or low spots; work them out with the sandpaper.



6. The last step is to balance the finished prop. A mandrel through the mounting hole (in this case, a piece of brass tube) and two parallel edges will locate the heavy blade. Sand that heavy blade until a balance is achieved.

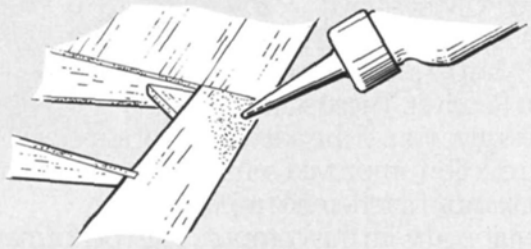
POPULAR SIZE PROP BLANKS

DIAMETER	THICKNESS	TAPER TO
6x3	¼ inch	1/16 inch
8x4	5/16 inch	3/32 inch
8x6	11/32 inch	3/32 inch
9x6	11/32 inch	⅛ inch
10x6	⅜ inch	⅛ inch

These measurements are not necessarily optimum, but they are fairly close. The width of the blank is 8-10 percent of its diameter and is governed by the blade template. To a large extent, blade shape will affect overall pitch. As a general rule, the widest part of the blade should be no more than half the distance from hub to tip.

Hints & Kinks

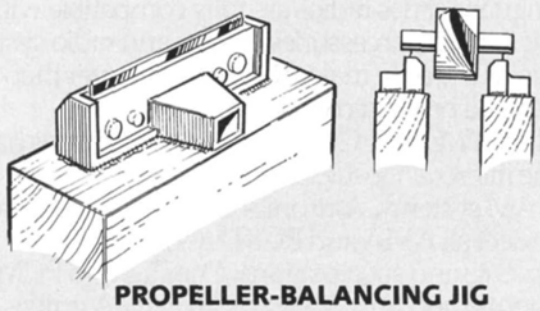
by JIM NEWMAN



HARD TRAILING EDGES

This will work well on smaller models, but larger airplanes may need more drastic treatment. Perforate the trailing edge and leading-edge members with a pin, then saturate that area with instant CA. This will harden the wood and make it resistant to crushing by rubber bands.

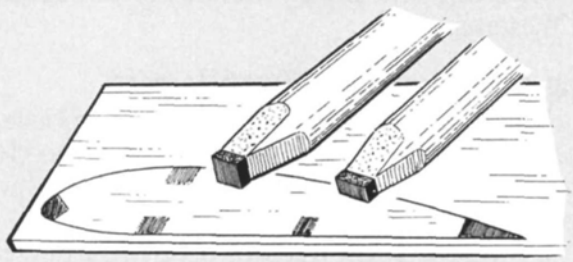
John Henrie, Pleasant View, UT



PROPELLER-BALANCING JIG

This sharp device is made by cutting away the plastic from a pair of disposable razors and leaving the blade exposed. The modified razors are then glued to two absolutely square blocks that are, in turn, glued to a flat base. The propeller is pressed onto a steel rod, and the whole thing is then set across the blades. The balance jig must be level in all directions, and you *must* have knowledge of balancing to use this effectively. (It's *not* just a matter of seeing if the blades stay horizontal.) Save the razors' plastic safety caps to cover them when the jig is stored.

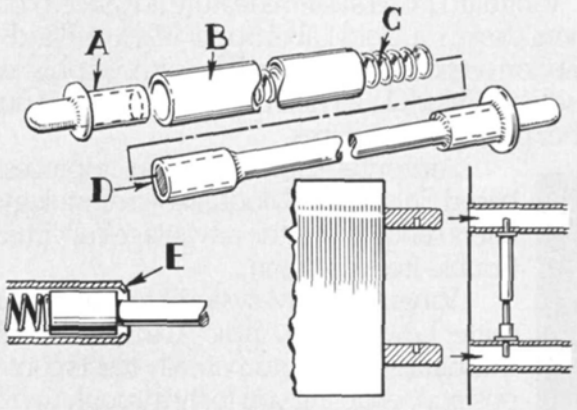
Horace L. Adams, Mount Dora, FL



RUBBER STAMPS

This scratch-builder is tired of marking spar and stringer slots the hard way on his traced-out ribs and formers, so now he rubber-stamps them. He makes the stamps from 3-inch lengths of dowel shaved at the end, and then he glues rubber pads to that end. The rubber pads are cut to the cross-section shape of his spars, etc., so that the only requirement now is a well-inked stamp pad.

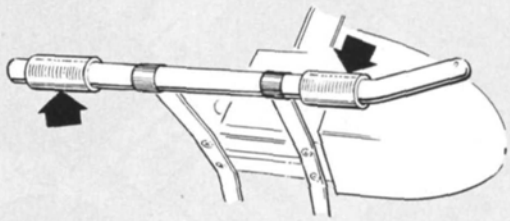
Vince Pawlowski, Houston, TX



SPRING-LOADED RETAINING PINS

Here's a large-scale version of those spring plungers that hold your watch band to the watch. "A" is a hollow rivet soldered onto a $^3/_{32}$-inch music-wire pin, which is, in turn, soldered into the ⅛-inch i.d. brass tube, "B." "C" is the spring from beneath the flint in a Bic lighter, while "D" is the plunger, comprising a piece of $^3/_{32}$-inch music wire with a ⅛-inch o.d. brass tube and a ⅛-inch hollow rivet soldered onto it. "E" shows how the ⅛-inch i.d. tube is crimped to retain the plunger. The wing roots have stub spars or tubes that fit into matching boxes or tubes until small holes in both are aligned; then, the spring-loaded pins are inserted as shown. (This also worked well on a full-size sailplane I once flew!)

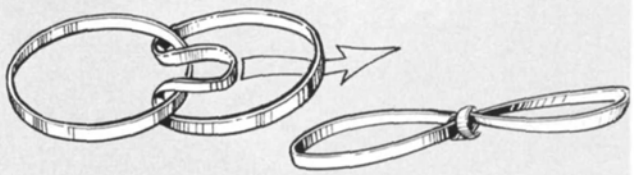
Gene DeCook, Canandaigua, NY



ANTI-SCUFF SKIDS

A chopper pilot did so many "crash 'n' dashes" (probably on blacktop lots) that he wore holes in his skids. His remedy was slipping pieces of vinyl hose over the skids (as shown), so that the plastic takes the wear and can be inexpensively replaced.

Jacob Lavery, San Francisco, CA



EXTENDING RUBBER BANDS

Cutting wing bands from inner tubes has been discussed here before, but our contributor explains how these bands can be looped together to form one longer loop for larger wings. Of course, this can also be done with regular bands, too.

Juan Pablo Movarec, Santiago, Chile

Model Airplane News will give a free one-year subscription (or one-year renewal if you already subscribe) for each idea used in "Hints & Kinks." Send rough sketch to Jim Newman, c/o **Model Airplane News**, 251 Danbury Rd., Wilton, CT 06897. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO, AND NOTE YOU SUBMIT. Because of the number of ideas we receive, we cannot acknowledge each one, nor can we return unused material.

PREDATOR

Construction

by GARY BERG and CINDY WARREN

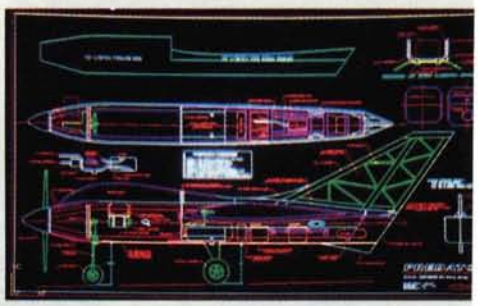
AN UNUSUAL "TAIL-LESS" SPORT DESIGN DEVELOPED ENTIRELY ON THE COMPUTER!

WHEN YOU PUT a high-tech engineering computer and a high-flying R/C hobbyist together, what do you get?—the Predator! As an employee of Dowty Decoto, an aerospace manufacturing firm, my constant companion during weekdays is a Unigraphics II computer-aided design and manufacturing system, produced by a division of McDonnell Douglas. Its daily task is to generate engineering drawings and related information, which we use to build equipment for the aerospace industry. When I introduced the system to the world of model aviation, the Predator resulted.

Unique in appearance, the model was designed to be a good-looking, agile performer and it's easy to build and fly. Although not a beginner's plane, the model can be flown by anyone who can handle a good low-wing Sunday flier; so if you'd like to tear up the skies with a real performer, the Predator will be a fun change of pace.

The design methods may be state-of-the-art, but the construction and materi-

SAVE TIME WITH CAD



THREE-DIMENSIONAL Computer-Aided Design (CAD) has become standard for the production of thousands of types of parts, assemblies and structures. Everything from sneakers to the Space Shuttle has components that were designed with the help of computers. Before the actual hardware is ever made, a full-scale "model" can be built on a computer screen. This model can be easily examined, assembled or modified, to verify the integrity of the design without costly and time-consuming production re-work.

Just what every R/C designer needs—a full-blown CAD system. Next, we'll go from disc to cutter to produce wooden parts just like the big guys do with NC equipment!

The design of a model airplane may not be so critic but CAD provides the same benefits. For example, airfoil shape can be entered into the machine and, on defined, this shape can be scaled up or down, relocated edited in a matter of seconds. When finalized, an enti wing structure can be generated from this single airfoi

als are user-friendly and familiar. The use of lite-ply and spruce makes the airframe very strong, so additional strengthening isn't necessary and will only add weight. Careful selection of building and finishing materials will result in a light, attractive aircraft.

CONSTRUCTION: As I mentioned, construction is fairly straightforward. Building will go much faster if you start by cutting out all the parts, so making your own "kit."

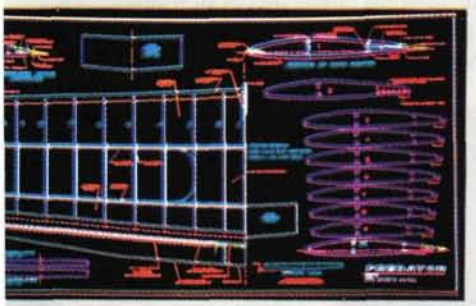
- Wing: Begin by pinning down the bottom front and rear spruce spars. The rear spar must be shimmed up off the board for proper positioning with the ribs. Glue all the ribs into place, then add the top spars, the ½-inch-square balsa leading edge and the 1¼x¼-inch trailing edge. When the glue is dry, install the sheeting over the leading and trailing edges and center section, and add the cap strips. Allow the wing to dry thoroughly before removing it from the building board, then turn it over and trim the building alignment tabs from the ribs.

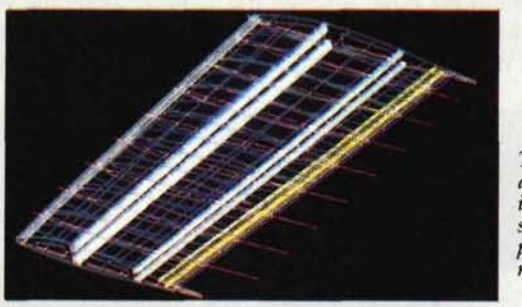
Designer Berg seems pleased with his CAD Predator. Designed during lunch hours, we're sure!

The elevons are built by laminating a molded gapless hinge between a strip of balsa trailing-edge stock and a strip of lite-ply. (CA should be used throughout this assembly.) Make several pinholes through the balsa so that the glue can penetrate. The elevons are attached to the wing by laminating the other flange of the hinge between the wing's existing trailing-edge stock and the strip of ⅜x¾-inch rectangular balsa. (Again, use CA.)

With the elevons attached, the wing panels are joined by laying them upside-down and inserting the plywood dihedral braces and wing-mounting plate. When the glue is dry, add the balsa sheeting and cap strips to the bottom of the wing. Add the elevon torque

(Continued on next page)





This kind of accuracy isn't obtainable by using conventional drafting techniques; also a great time saver. Design can be printed on plotter to any scale, including man-carrying!

A copy of this shape is placed at the wing root. Another copy, scaled down slightly, is placed at the tip. The outer surface of a tapered wing panel has now been defined. This surface can be sliced at regular intervals, creating exact patterns for wing ribs. Standard stock sizes are then laid in place for spars and leading and trailing edges, giving each rib the necessary notches. A complete wing design in minutes; no pencils, no balsa scraps, no headaches!

While the Predator was the product of a million-dollar industrial computer system, there are reasonably priced drafting packages available for your PC, too. Before long, you'll be throwing away your T-square and buying food for your new "pet mouse!" ■

PREDATOR

rods, the balsa filler between the elevons, and the wing tips. Carve and sand the entire wing to shape and add the ¼-inch dowel to the leading edge.

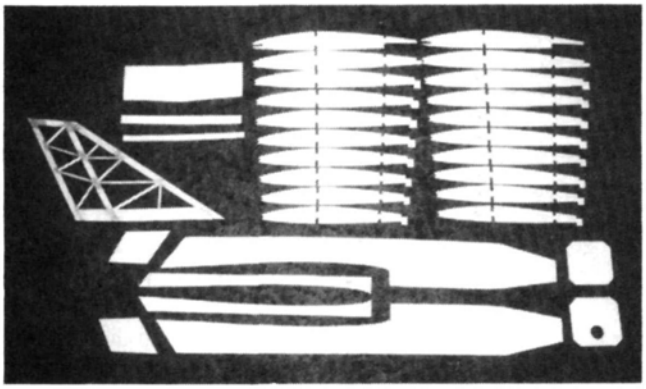
Spruce spars and ply wing joiners make a very strong wing, so wrapping the center with nylon or fiberglass isn't necessary and will just add weight.

• Fuselage: Glue the ply wing saddle doubler and ½-inch triangle balsa into place on the fuselage sides. Be sure to make a right and left side! Join the sides by gluing the fire wall into place, along with the ¼-inch sheet balsa on the top and bottom in front of the fire wall. When dry, pull the sides together and glue the bulkhead and the ¼-inch-square balsa tail cross-pieces into place. Add the ply landing-gear plate and braces, and the ⅛-inch balsa top and bottom sheeting. Leave the last 12 inches of sheeting off the bottom for now, and bolt the threaded nylon wing-mounting blocks into place.

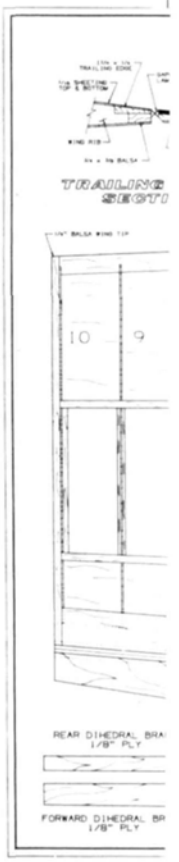
Place the wing on the fuselage. When it's perfectly aligned, turn the model upside-down and mark the locations for the wing-mounting bolts. Remove the wing and drill the holes. Turn the wing over and enlarge the holes in the top sheeting so that the heads of the nylon bolts will pass through and rest on the ply wing-mounting plate. Install the balsa tail section and the remaining sheeting on the bottom of the fuselage.

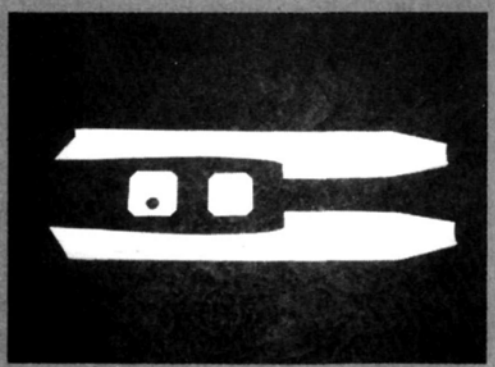
Install the engine mount and the engine and shape the fuselage to blend smoothly from the spinner to the tail. Bolt the wing into place and fill the area behind the fuselage bulkhead with scrap balsa.

Build the fin, sand it to shape and glue it to the wing. *Do not glue the fin to the fuselage!* Glue the balsa triangle stock into place along the wing/fin joint. Short pieces of triangle stock are glued to the fuselage tail section to form a slot for the fin to lock into when the wing is bolted into place.

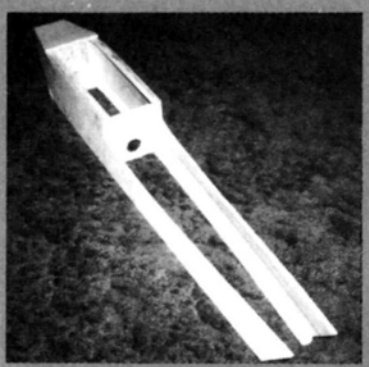


Here's where it all starts. A hand-cut "kit." Vertical fin has already been assembled.

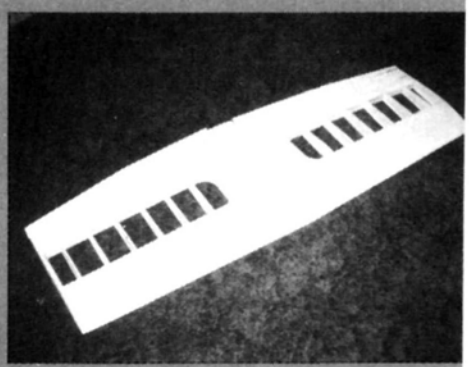




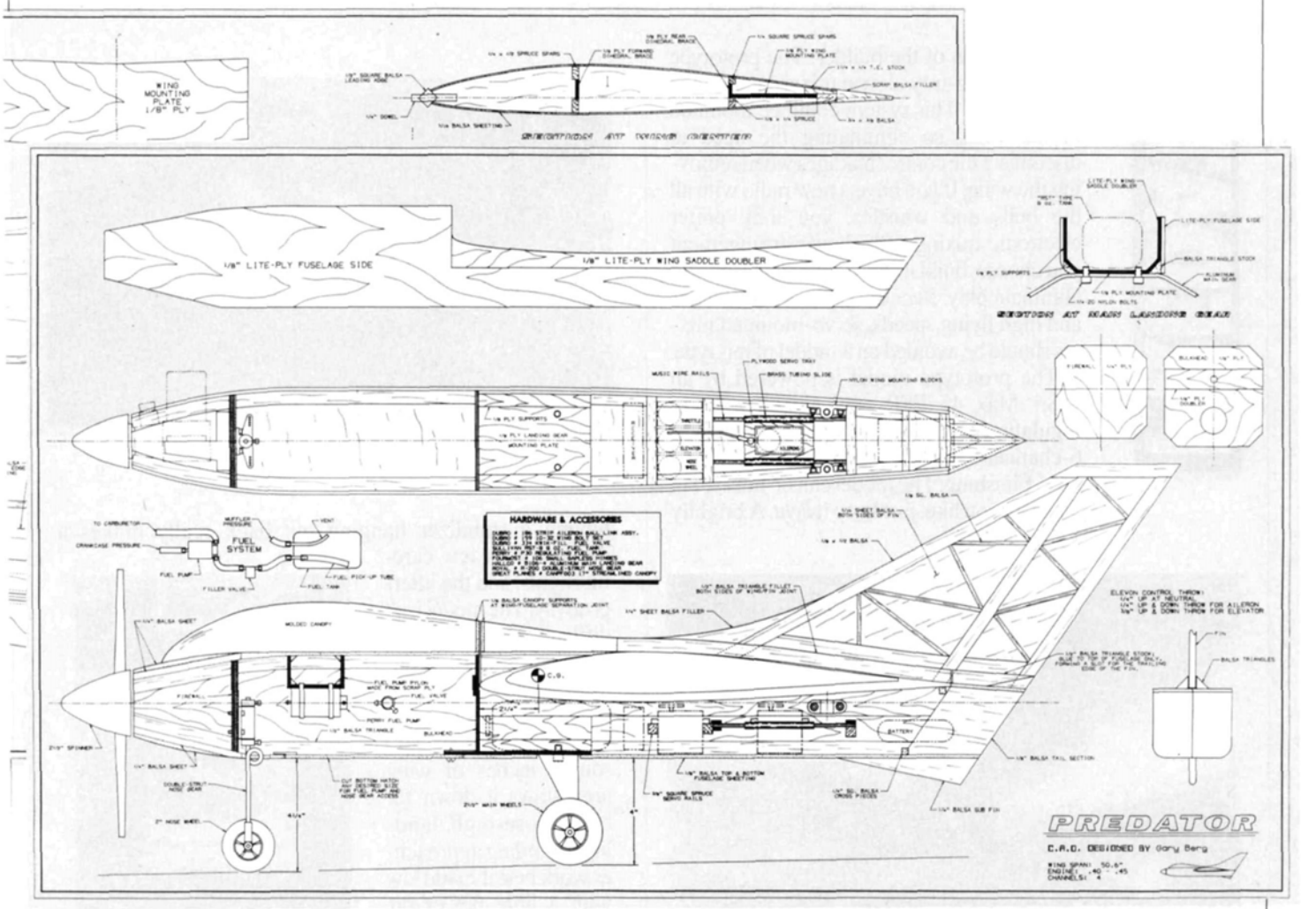
Minimum parts count in fuselage: two bulkheads and two sides. (Easy enough!)



Basic fuselage assembly isn't complicated but it is rugged.



Completed wing, ready to cover; lots of area.



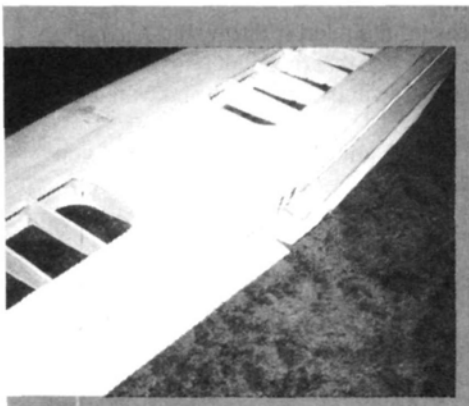
ORDER THE FULL-SIZE PLANS . . . PAGE 132.

Trim the canopy to fit the fuselage. People's eyes tend to focus on this area, so a pilot or simple cockpit details will add a great deal to the finished aircraft. Glue the canopy down in one piece, then use a razor saw to split the canopy at the wing/fuselage joint. Smoothly blend the canopy to the fin with putty or filler.

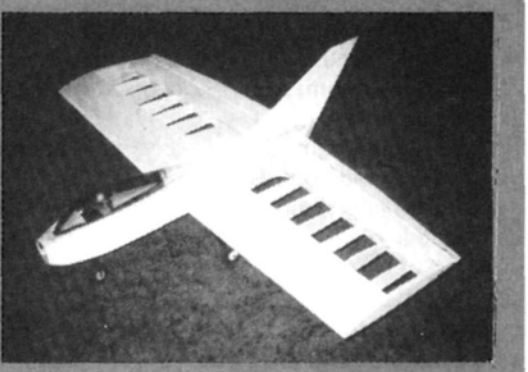
Cut the bottom hatch any size you need for access to the fuel pump and nose gear, and add any desired mounting provisions. Build the fuel-pump pylon from scrap ply or spruce and install it in the fuselage. The pump should be located near the fire wall so that the pressure hose from the engine crankcase will be as short as possible.

• Engine and Radio: Mounting the fuel tank under the wing at the CG is a *must.* Mounting the tank behind the fire wall would make the model excessively nose-heavy with a load of fuel. This is fine, if all you want to do is scream down the runway and roll off the end, because the model won't rotate and take off! (Yes, I tried.)

The radio arrangement is at



e-up of wing center section showing control-ace linkage. "Striperons."(?)

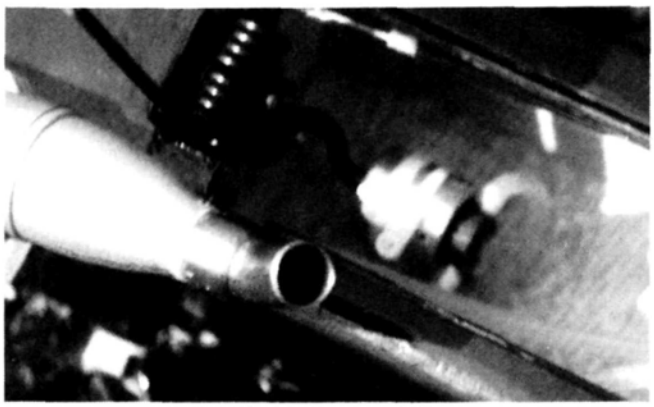


Canopy and pilot figure produce sharp, realistic appear-ance. Generous wing area is evident.

the discretion of the builder. The prototype uses a sliding-tray elevon mixer mounted in the fuselage. This system could be mounted in the wing, so eliminating the need to disconnect the control linkages when removing the wing. If you have a new radio with all the bells and whistles, you may prefer electronic mixing. Whichever arrangement you choose, build it solid and use ball links to eliminate play. Because of the large elevons and high flying speeds, servo-mounted mixers should be avoided on a model of this type.

The prototype model is powered by an O.S.* Max 45 FSR engine with a Perry regulating pump, and it's all steered by a 6-channel Futaba* Conquest radio.

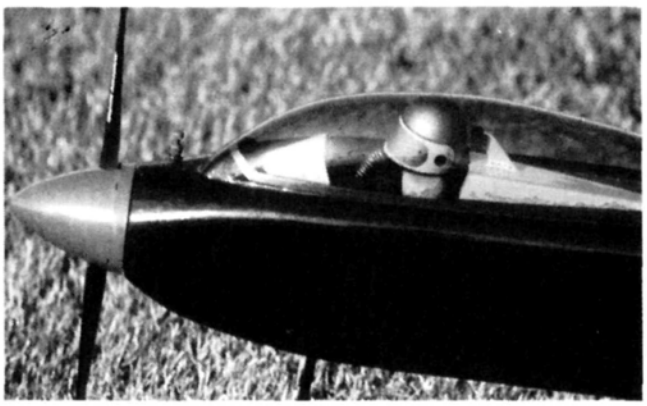
• Finishing: The model can be finished in any way you like; just keep it *light*. A brightly colored finish will be good-looking, and it will make the model easier to see in the air. (Remember, this is a fast, maneuverable plane.) My prototype is finished with metallic red, blue and charcoal Super MonoKote*.



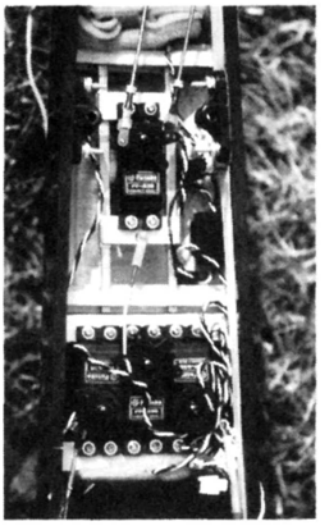
Close-up of nose-gear area shows Perry pump, double-coiled nose-wheel strut and downward exhaust deflector.

PERFORMANCE: Now for the fun part! As with any new model, a complete ground check of the engine and radio must precede the first flight. Find your problems now, not later! With the CG and control throws set as shown on the plans, control response is crisp and smooth.

The most difficult aspect of flying the Predator is the fact that it just *looks* so different. If you're accustomed to flying a conventional aircraft, it may be difficult to see exactly what it's doing up there. Not having a stabilizer hanging out back really makes a difference! A few careful flights, and the jitters go away. The model isn't difficult to fly; it tracks very solidly and the control response is sharp and precise at any speed. As fast as it is, over 800 square inches of wing area slows it down for easy, nose-high landings. Landing approaches work best if made low with a little power on, instead of with a high, gliding approach. Cut to an idle just as it nears the runway, and give it a long, smooth flare. It should settle in on the mains, with the nose wheel high off the ground. After getting acquainted, try increasing the aileron throw, but leave the transmitter dual-rate on low so that the model still flies in the same way. Once airborne, switch to high rate and watch the corkscrews....



Pilot, canopy and spinner installation.



Adequate room for standard-size servos—even three abreast—in radio compartment.

I hope you enjoy building and flying the Predator. If you have any comments, suggestions, photos, etc., I'd love to receive them. Write to me, Gary Berg, at 13 So. 9th Ave. #8, Yakima, WA 98902.

**Here are the addresses of the companies mentioned in this article:*

O.S.; distributed by Great Planes Model Distributors, 1608 Interstate Dr., P.O. Box 4021, Champaign, IL 61820.

Futaba Industries, 555 W. Victoria St., Compton, CA 90220.

MonoKote; distributed by Top Flite Models, 2635 S. Wabash Ave., Chicago, IL 60616. ■

SCALE MASTERS

by FRANK TIANO

1 9 8 8

This contest had no losers, only winners who fought for every fraction of a point!

Above: *A scowling Charlie Nelson must be recalling the tough trip to Kentucky from his home in Massachusetts. Scratch-built E-type Waco.*

Below: *Second-placer, Bob Frey, from Arizona, finished only two points behind Bob Fiorenze. His "smallish" (62-inch span) P-47 proved quality can overshadow size.*

Photos by Frank Tiano.

Outstanding warbird line-up. Front to back: Bill Carper's Jug, Bill McCallie's FW-190D9, Thomas's Spit, Dee Lopez's F6F, plus lots more "heavy metal."

Don Hatch places his Cessna AG Truck on the static judging table. His 94.5 was highest Civilian Static score.

LAST YEAR, Las Vegas played host; the year before, it was Los Angeles; before that, it was Phoenix and Kansas City. Well, this year, the Masters was held in Fort Knox, KY. Yes, the same Fort Knox that Sammy keeps his gold chains and charms in; a secure little town where most of the population works for the large military base. Because of the generosity of a few military personnel and the hard work of the S. Indiana R/C Club and the Knox Model Airplane Club, this was one of the smoothest Masters ever.

All contestants stayed in the nearby town of Radcliff—a small place whose claim to fame is that it has more fast-food restaurants per square mile than

Wayne Siewert's Nats-winning Mooney scored 91 in Static and ended up in 33rd place. Talk about tough competition!

Gene Barton flew his red P-51C Mustang to a well-deserved 3rd spot.

anywhere else on this planet. And because it's in a dry county, you can imagine the buzz created when Gene Barton and the California Scale Squadron stormed into town towing two trailers, one containing the group's airplanes and a larger one containing 40 cases of iced Budweiser! If that wasn't enough, Al Casey, Bob Frey and Kent Walters pulled in a few hours later in a Coors Light vending truck with their aircraft in tow!

Harris Lee, the "father" of the Masters, once again sweet-talked Pacer Technology* (maker of Zap glue) into sponsoring this ninth U.S. Scale Masters. The Zap gang took care of flying-in the judges and key people, certain hotel accommodations, a Saturday-night banquet, prizes and keepsakes. Dale Drew, the contest director from the Indiana Club, with Jim Wolfe at his side, did a remarkable job of keeping things under control. There were no flight-line problems in five rounds of flying. Dave Voglund, the contest manager from the Knox Club, took care of the other aspects not associated with flying, and he did a super job as well. From the looks of the trophy table, Futaba* was once again very generous. We spotted four radios up there, along with the other awards. Mr. Hal Okert handled the chores of chief judge, and Jerry Crandall (the famous aviation artist) wasn't only a static judge, but also contributed beautiful copies of his artwork as prizes. But the big gun, the shot in the arm, the big boost, came from Pacer Technology: Herschel Worthy, Pacer's representative, summed it up well when he said something like, "You've shown your loyalty to us by purchasing our products and making us the number-one adhesive group in the hobby market today. What better way to show our appreciation than to send some of that money right back where it came from—to you, the modelers."

Along with a runway that went to infinity, the contestants were blessed with almost-perfect weather and light winds (although hurricane Gilbert gave us a little scare). Even though competition was fierce at times, the camaraderie of the pilots

The author, Frank Tiano, grabbed 4th place with his Kawasaki KI-61 Tony, which was reduced to kit form in the post-competition festivities!

The infamous "Being Last Sucks" T-shirt proudly worn by some scale "immortals." (Almost as hotly-contested as taking 1st place!)

1988 SCALE MASTERS FINAL STANDINGS

Name	Aircraft	Place
Bob Fiorenze	Northrop F/A-18	1
Bob Frey	P-47D	2
Gene Barton	P-51C	3
Frank Tiano	KI-61 Tony	4
Bill Miller	DC-3	5
Diego Lopez	Hellcat	6
Mark Harrell	J-3	7
Shailesh Patel	P-47	8
Bill Carper	P-47	9
Tom Kosewski	Fokker D-7	10
Neil Snodgrass	Midwing Special	11
Jeff Foley	ME-109G	12
Dick Hansen	Jenny	13
Tom Czikk	P-40C	14
Dennis DeWeese	FW-190A8	15
Austin Cleis	Piper Tomahawk	16
David Pape	Kinner Sportster	17
Skip Mast	C-130	18
Charles Nelson	Waco VKS-7F	19
Jeff Micko	P-47	20
Chuck Fuller	PT-22	21
Bill McCallie	FW-190D9	22
Al Casey	MIG-3	23
Dale Cordes	Jungmeister	24
Frank Pring	AT-6	25
Frank Thomas	Spitfire	26
Dave Voglund	P-40	27
Mel Whitley	T-28	28
Bob Wischer	Mailplane	29
Joe Naber	Tucano	30
Bruce Cooper	Laser	31
Ron Compton	Rose Parrakeet	32
Wayne Siewert	Mooney PFM	33
Irv Searl	Jungmeister	34
Al Kretz	Miniplane	35
Buzz Butler	BD-8	36
Randy Etkin	Mooney 21	37
Steven Sherwood	Beech Staggerwing	38
Gary Ponnell	Stearman	39
Olan Trenary	Chipmunk	40
Greg Wilson	Sopwith Triplane	41
Dave Rech	F4U Corsair	42
Jack Buckley	Waco YMF-5	43
Dave Sawatski	T-34C	44
Jerry Fingler	Cessna Bird Dog	45
Ernie Harwood	Spitfire	46
Charles Duval	PT-19	47
Charles Reeves	Art Chester Jeep	48
Dennis Cain	Fleet	49
Lee Rice	P-51	50
Don Hatch	Cessna AG Truck	51
Greg Namey	FW-190D9	52
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SCALE MASTERS

1 9 8 8

David Pape, from Canada, brought his Kinner Sport, complete with handmade, 5-cylinder, 4-stroke engine. Placed 17th.

After the smoke cleared, Bob Frey's "smallish" P-47 took 2nd-place honors. You don't have to be big to be good!

The C-130 Hercules, by Skip Mast, on a fly-by. Four K&B .21s used for power. Presented as a MAN *construction article, plan No. 12811. Finished in 18th spot.*

Tom Czikk's beautiful P-40C on takeoff roll; 80-inch span with a Rossi .90. Second-highest static score with a 95.5.

was shown by the way they lent one another props, tools and plugs, etc.

The first round of competition is usually what we call the "throw-away round." Some pilots use the first flight to get used to the field, its winds, humps, bumps and surrounding trees. Dale Drew thoughtfully provided a parallel grass runway for those who brought airplanes that were more suited to grass, and that made everything a lot fairer. Things had settled down by the time the second round came along and the first 15 places started to "juggle about." Two real heavyweights were obviously missing from the first round—Kent Walters and Dan Parsons. Both totaled while practicing on Thursday. Kent's Dauntless just rolled in from level flight and Danny's Hornet had its feet switched in the sun. Guess this forces Cowboy to finally build another airplane!

By the middle of the second round, we started to notice a few new names in the top 15. This made all the veterans look around for some of these airplanes and pilots. Tom Kosewski, Mark Harrell, Bill Miller, Tom Czikk and Bill Carper were just a few of those who were new to some of the "old salts." With a neat Fokker D-7, Tom sat there with high static at 96 points; he flew it well, but not well enough to win, and was in 10th place at the end. Bill Miller really made everyone take a second look when, with his Royal DC-3, he started popping flight scores in the low 90s. His efforts eventually earned him a 5th spot—the break-point for not having to qualify for next year's Masters. Bill Carper flew one of the prettiest Bert Baker Thunderbolts we've seen, and a 93 static and low 90 flights led him to 9th. Tom Czikk had an absolutely amazing Curtis P-40 Tomahawk in A.V.G. livery—you know, the famous Flying Tigers. Tom had a 95.5 static, but just couldn't get a flight score sufficiently high to win the gold. At the end of the second round, he was in 3rd place, though. Some of the others jockeying for those first 10 or 15 spots were Bob Frey and his P-47 Thunderbolt from Holman plans; Gene Barton with the famous Red P-51 Mustang, designed by Rick Lewis; Diego Lopez with a beautiful Don Lien Hellcat that's probably Dee's best effort yet; Jeff Foley campaigning his Platt ME-109; Denny DeWeese with a Lien Focke Wulfe 190A and me with my Kawasaki Tony. After the second round, Harris Lee invited all of us to a cocktail party at the officers' club at the base, and most of us just couldn't wait.

"...the quality of the birds at this year's event was the best so far."

There was more than enough time after the first round, and before the start of Saturday's second round, to really scope out the competition. Without looking at every individual's documentation, it was impossible to know why some static scores were given to certain aircraft. Overall, however, the quality of the birds at this year's event was probably the best so far. As we wandered around the pit area, we realized that almost any airplane there could win almost any contest in the country. These were all winners, brought

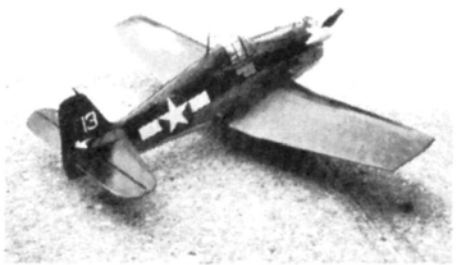
(Continued on page 57)

Small Steps

by RANDY RANDOLPH

THIS COLUMN IS NOW well over two years old, and it still seems like only yesterday that we were waiting for the responses to our first efforts. Thankfully, they were good! It was great discovering there were others—many others—who shared our feelings and interests. The good things remain fresh in my memory.

One of the promises made in the beginning was to present the *real* experts—you—rather than treating this thing like a lecture. This month's first expert is Lou Durso of Yaphank, NY.



Lou Durso did a fine job of converting this Guillow F6F-5 to R/C, using an O.S. .10 FSR for power.

Lou writes: "A few months back in 'Small Steps,' photographs of models were requested. Therefore, enclosed are pictures of my F6F-5 Hellcat. I made it from a Guillow kit, No. 1005, and it has a 32½-inch wingspan. I have it set up with an O.S.* .10 FSR engine and Airtronics* 631 servos to work rudder, elevator and engine throttle. This ship is roomy enough to accommodate a fourth servo for ailerons, but at this time, my wing loading is 18 ounces per square foot. Going to micro- or mini-servos would make a big difference, but 631s are all I have at this time.

"Every experienced R/Cer I've talked to doesn't care for the Guillow models—especially with a single-pulse system for rudder-only control and engine running at full throttle. I've heard everything from, 'very hard to handle,' to 'It's too sneaky.' I think it's a real shame that Guillow hasn't come out with a few models in the 36- to 40-inch-wingspan range. They have some very super-looking scale models, but most R/Cers shy away from them because of their small size. Maybe this letter could stimulate Guillow to make at least a larger kit of the Hellcat for starters—who knows?"

Guillow is a very old company in the model business and, as Lou states, it has a stable of really beautiful scale models. Maybe someday, with a little help from all of us, they might just redesign some of those dandy kits for modern mini-R/C systems and make a lot of folks happy (and themselves some extra change).

You remember Ralph Pearson from past columns? Well, Ralph has some advice for those who want to use the Ace* throttle sleeve on their Cox* ½A engines. He suggested I do a "How To" on the subject, but he does a better job than I could. Here's Ralph!

"On fitting the Ace throttle sleeve to the Cox .049-.051: TDs, as you know, are not a perfect fit. I even found burrs on one, so I usually lap-fit the sleeve using a lapping compound, but toothpaste will do.

Good example of a bad example! The "other side" of Randy's shop.

"In every case, I found it necessary to remove a small amount of material from the bottom of the sleeve to prevent binding when the cylinder was tightened. I 'scrub' the sleeve bottom on a piece of 220 wet-or-dry sandpaper (using oil) until a fit is achieved. Sometimes, the sleeves will bind on the back of the needle-valve body; a little filing on the body cures this problem. After fitting at least six of these sleeves (some for friends), I now have the system down pat."

Good news! C.B. Associates now offers a long ½A mount that will accommodate the G-Mark .061 as well as the Cox TD .049-51.

Ralph describes the situation perfectly; I can't remember ever fitting a throttle sleeve when one or the other of his tricks weren't needed. None of these little chores takes much time or effort, and the results are worth it, because the Ace sleeve is a very good way to throttle the Cox Tigers.

The two gentlemen who shared the preceding information with us were both from the state of New York. The next letter is from a part of the country that enjoys year-round flying. Mr. Pat Quaratiello, of South Daytona, FL, the floor is yours:

"I just finished reading about the Q-Tee ½A model, and I'd like to tell you about another excellent ½A plane—the Wizard, by Ace R/C. I built mine with rudder and elevator control, a Cox Dragonfly engine, and I left off the landing gear. It's my first plane, and I was able to hand-launch, fly and solo after only seven flights. Although I had the help of experienced modelers, I found the plane very forgiving and very easy to fly with power on or off. Landings are a breeze: I just fly the plane to a landing or its belly. This model gave me the opportunity to enjoy R/C on a limited budget; I recommend it to any beginner."

The Wizard has put a lot of people through basic, and it would be interesting to know just how many fliers learned on this bird. Come to think of it, it might be

(Continued on page 92)

THE VICTOR'S VIEW OF THE 1988 SCALE MASTERS

All it takes is time, patience, practice, experience, initiative, organization and, oh yeah, a little luck!

Photos by Dan Parsons.

BOB FIORENZE
talks to MAN

I EXPECT THAT, by now, many of you, especially those of you interested in R/C scale or ducted fans, have heard of Bob Fiorenze. If you've been in R/C for any length of time, I'm sure you've read about him and his black Jet Model Products F-4J Phantom, finished in the Playboy markings of Navy Test Squadron, VX-4.*

I've known Bob for a number of years, consider him a friend, and continue to be impressed with his brand of building and flying. I've often wondered what approach he takes with his projects that allows him to be so consistent, and I thought his answers would interest other modelers as well.

Last year, Bob "switched his ride" from the F-4 to the F/A-18 Hornet, and he's been flying the original version since the Canadian Quinte Fan Rally. While flying the original, he was building another, which he intended to use primarily for competition. It was built from a pre-production Yellow Aircraft kit, and, as you can probably tell, it's exquisite.*

Long before Bob went to the Scale Masters, I had asked him to prepare an article describing his "diary" of the competition, as well as answering some specific questions about his techniques. While we didn't have a crystal ball, we did have a strong feeling that Bob would do well... and he did: He won the event! Here's his story:

MAN: Can you give us an estimate, as "ball park" as it may be, of the time required to build your winning F/A-18 Hornet?

Bob: It will usually take me about two years (at three hours a night) to complete a Masters-quality airplane. However, because of an accelerated building schedule dictated by the fact that I wanted this F-18 for the Scale Masters, I did it in about six months, but at what *seemed* to be 14 hours a day!

MAN: You seem to be a detail-oriented person. How important is this quality in becoming a Scale Masters competitor?

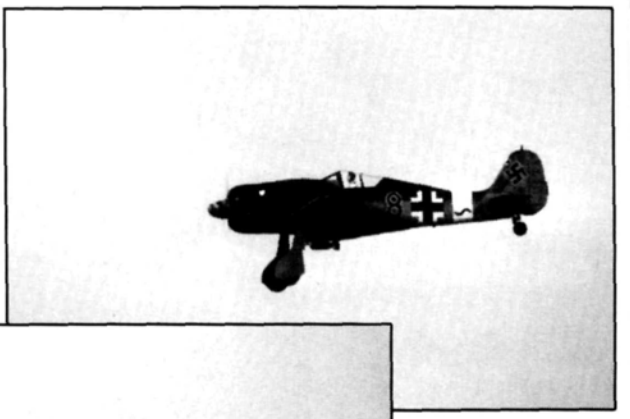
Bob: To win the Masters, you need a few things like:

- Good building techniques;

- Good flying abilities;
- *Luck:* Some of this is "ensured" by paying attention to details, such as preventive maintenance (taking the airplane apart every two to three flights and doing a thorough inspection); maintaining the reliability of your equipment by keeping logs and making needed repairs as soon as a problem is recognized (not when something stops working); and flight-testing and developing a "routine" with the airplane to understand it. When you get it sorted out, *don't* change anything!

MAN: Tell us a little about your Hornet.

Bob: It's just over 8 feet long with a 6-foot span. It weighs 27 pounds and is powered by a pair of Dynamax fans driven by O.S.* .77 ducted-fan engines. I use a material called "Fascal" over all the balsa surfaces, and the fuselage is fiberglass. Automotive finishing materials are used for the paint, including acrylic lacquer for color. One of the unique features is the use of electric wheel brakes. The most difficult part of the construction was the landing gear system, especially the operation of the 10 gear doors! One channel is used for gear operation, and the doors are opened by springs and closed by pull cables. Three servos are used for the door sequencing alone.



It's competition like Bill Miller's DC-3 and Denny DeWeese's FW-190 that makes the Scale Masters the toughest scale contest around! Point differences are measured in fractions.

MAN: Have you given any thought to your next project, or will you take a breather and concentrate on flying the F-18 in competition?

Bob: After the effort on the Hornet, I don't have a new project in mind for the near future. I'm leaving the New York area for Florida where I'll be opening a new hobby business. *That's* my "project" right now. However, a T-38 or F-111 would be a possibility in the distant future.

MAN: Your Playboy F-4 Phantom is certainly well-known and uses the same propulsion packages that are in the Hornet. Do the two airplanes fly about the same?

Bob: No, not really; they both fly well, but quite differently. The F-4 is slightly smaller, and lighter by about 7 pounds. This makes it more powerful, faster and more nimble. The F-18 is larger and slower, and has better scale speed—that's really important for "realism" points.

MAN: On reviewing your "diary" of the Scale Masters competition, I was a little surprised that such a seasoned, competitive flier still refers repeatedly to "butterflies" being a problem. Do you think everyone experiences them?

Bob: I'm not sure about anyone but me! In spite of all the preparation, making everything as "right" as possible, there are always things you can't anticipate. My first flight at the Masters was a 76. The needle setting was too rich, and I almost lost the airplane on takeoff, but I elected to continue anyway. Maybe it wasn't the right decision, but it made me recognize that something wasn't "right," so I fixed it. The result was that my score for flight number 2 was 94.75. There's a lot of pressure during the competition: Remember, each of the guys here placed high in regional competitions to get to the final. It's a very tough contest, and that makes winning it so much more worthwhile.

That's the way Bob sums it up. To him, and all the other Scale Masters competitors, we offer our congratulations for some great R/C scale efforts.

**Here are the addresses of the companies mentioned in this article:*

Jet Model Products, 304 Silvertop, Raymore, MO 46083.

Yellow Aircraft & Hobby Supplies, Ltd., Suite 201, 3040 Palston Rd., Mississauga, Ontario, Canada L4Y Z26.

O.S.; distributed by Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820. ■

Helicopter Challenge

by CRAIG HATH

WINTER IS HERE, and if you live in a part of the country where flying is impossible at this time of year, you should take a few steps to store your helicopter properly. The first step is to remove *all* the fuel from the fuel tank and engine, and the best place to do this is at the field, as you finish your last flight of the season. Land your helicopter, stop the engine, pump any remaining fuel out of the tank and re-connect the line to the engine. With the engine set at idle, start the engine and allow it to run until it stops. Attempt to re-start the engine until it refuses to pop or sputter. This process will usually get most of the raw fuel out of the engine, and then it will be ready for some type of after-run oil. I've used Marvel Mystery Oil, automatic transmission fluid, and Pacer Technology's* after-run oil with equal success. If you have a Y.S.* engine in your machine, you should use Lube-master After-Run Oil, which is available from Powermaster Products, Inc*. This is the *only* oil approved by Futaba-Y.S. for use in this engine, as other types of lubricants may damage the diaphragm in the pump. Pour a liberal amount of the oil into the air intake of the carburetor. Also, remove the glow plug and inject a generous amount of oil into the combustion chamber. Turn the engine over by hand several times, then turn the helicopter upside-down and turn the engine over again. This should put some oil on the bearings of the engine, and it should prevent moisture from contaminating the inside of the engine and also protect its moving parts from rusting.

Next, inspect the entire machine for any repairs that may be needed. It's a good idea to fix anything you find right away, so that it doesn't slip by when you're getting ready to fly next spring. Clean the helicopter thoroughly, and check for loose fasteners. Mark the rotor blades and blade grips on the rotor head so that each blade may be identified with its blade grip. Remove the rotor blades. Using a light machine oil, lubricate all the mechanical moving parts and coat all bare metal parts with a light layer of oil. Completely charge the transmitter and receiver batteries. Finally, wrap the helicopter in a large plastic trash bag, seal the bag, and store the helicopter in the driest area you can find.

By following these steps, you'll be able to unwrap your helicopter next spring, charge the batteries, bolt on the blades and fly. No need to worry about corrosion or rust, and no racking your brain trying to remember if you need to make repairs.

These photos show the new EH-550 electric R/C helicopter from Asionic of Japan. The kit isn't yet available in the U.S., but Hobby Dynamics Distributors is considering importing it.

Flight Training Continued

In the previous issue, I began a discussion of the basics of flight training. The method that I use works well, because it allows the beginner to progress rapidly through the steps, while preparing him for more advanced steps right from the start. While it may seem to take slightly longer to get to sustained hover, once the flier *does* begin hovering, he'll also be ready for forward flight. By following this method, he'll be much more competent with his machine than the flier who simply lifts his machine off the ground a few feet and holds it there. He'll have a much greater sense of how to handle his helicopter, because he's been challenged to move it around and fly it instead of being flown *by* it.

As I left off last month, we were "hopping around," learning how to move the helicopter forward and backward, and side to side in short "hops." The next step is to lift the helicopter into longer hops in a specific direction. Be sure that you can get the helicopter back to the ground safely by not allowing it to gain speed *after* it has begun to move, and keep the helicopter only a foot or so off the ground. In other words, we want to move the helicopter at a slow speed so that it won't get out of control. Some movement will help to stabilize the helicopter, so making it easier to control. The hardest part about this phase will probably be backing up the helicopter. The tail rotor is at the back, and to get the helicopter to back up, you need to point the tail rotor slightly at the ground. Be extremely careful when moving backwards, taking only short hops until you get the hang of it. Pushing a little forward cyclic just before landing will get the tail back up to level, so preventing it from digging into the ground.

Work on making the hops a little longer, and try to get to the point where you're following your helicopter around the field. Work towards becoming proficient at comfortably moving the helicopter in all directions, and don't be afraid to change direction midstream. Try moving 10 feet forward, then angle to the right for 10 feet, then straight to the right, back to the right for another 10 feet, straight back toward yourself for 10 feet, then to the left forward, etc, until you complete a circle. Practice this until you can hover in a circle without landing. Again, keep the helicopter only about one foot off the ground, and set it down gently if you get confused or disoriented. If you feel comfortable walking around with your helicopter while you fly the circle, do so. If you can stand in one place and perform the circle, do so. If you can stand in one place and fly the circle in front of you, that's even better! Just be sure that you keep the nose of the helicopter pointing

away from you so that you won't get caught flying nose-in; you aren't ready for that yet. Speed is important at this point, because it influences the ease with which you can start and stop the direction of the flight path. Be careful never to let the helicopter fly too fast. If you find that the helicopter is moving much too quickly,

Here is the Dave Brown pipe mount used to mount the Magna Pipe to the author's X-Cell. (See text for details.)

don't panic; just gently pull the collective pitch/throttle down, while simultaneously pulling back on the fore/aft cyclic. As the speed of the helicopter decreases, gradually release the cyclic control while increasing the throttle/collective enough to return the ship gently to the ground. Do *not* push the nose down and shove the throttle open, so putting the helicopter into full forward flight; you'll find that the results can be very scary!

That gives you plenty to work on for this month. Next month, we'll work on stationary hovering and enter our first circuit in forward flight. Remember that the steps you're taking *now* will pay off with big results on the steps we take later, so don't compromise your practice time trying to hover in one spot: Get that machine moving slowly around and learn how to make it move in the direction you want.

The photos show a very small model helicopter—the EH-550 from Aisonic of Japan—and it's powered by two No. 280 electric motors running off an 8.4V 600mAh battery, or from a 9V DC converter by cable. The helicopter is 19 inches long, has a rotor span of 19¾ inches, and weighs only 18 ounces, ready to fly, with batteries! The version shown has the Bell 222 body, and there's also a Bell Jetranger. The mechanics are a simple fixed-pitch system with full control of cyclic, tail rotor and throttle. A very tiny gyro system is in the works, and this should make it possible to fly the machine right off of your workbench! That's the good news. The bad news is that the helicopter isn't available yet in the U.S., but Hobby Dynamics Distributors* is considering importing the kit in the near future. Contact your local dealer for details.

Also pictured is my X-Cell* helicopter—in particular, the system used to mount the Magna pipe used on this machine. Actually, I stole the idea from my friend and fellow flier, Ken Wilson. The mount is the Dave Brown Products* pipe mount, with the long standoff cut to the angle of the bend in the side frame. You'll need a 2-inch-long 10-28 bolt (or something similar) to attach it to the frame. This system works well, and it keeps the pipe from beating itself against any other metal part and thus creating a radio signal of its own.

As a final note, be sure to check the Delta hinge pins of the tail-rotor systems of X-Cell helicopters. In the photo, you'll notice that the pin is working its way out of the hub. All that's needed here is to loosen the grub-screw in the output shaft, reposition the pin, re-tighten the screw, and check it frequently. It's a good idea to replace the pin occasionally, as the grub-screw can fatigue the part, so causing it to break in half. Remember, an ounce of prevention...! See ya next month!

**Here are the addresses of the manufacturers mentioned in this article:*

Pacer Technology, 1600 Dell Ave., Campbell, CA 95008.

Y.S., distributed by Futaba, 555 W. Victoria St., Compton, CA 90220.

Powermaster Products, 10103 Freeman Ave., Santa Fe Springs, CA 90670.

If you look closely, you'll see the hinge pin for the Delta hinge working its way out of the tail-rotor hub. Some regular maintenance will prevent this pin from coming out completely. (See text for more details.)

Hobby Dynamics, 3132 S. Highland Dr., Las Vegas, NV 89109.

X-Cell; distributed by Miniature Aircraft, 2324 North Orange Blossom Trail, Orlando, FL 32804.

Dave Brown Products, 4560 Layhigh Rd., Hamilton, OH 45013. ■

Golden Age of

by HAL "PAPPY" DeBOLT

In the November issue, I started to describe the Space Control concept, and now I'll finish the story, beginning where I left off: the transmitter.

Basic controls were by the single stick described previously. On the top rear corner of the transmitter was a knob that rotated for engine control. On the original "red brick" version, two knobs on the front panel controlled elevator and aileron trim. We soon decided that it would be more usable with the trim knobs moved to the side of the box where they could be operated by the fingers of the left hand. For easier operation, the engine knob was also replaced by a lever. Later on, there was a "gold-brick" update (gold anodizing was used instead of red) that incorporated these changes as well as improvements resulting from field use.

The system was finalized and put into production. The word was that our "story corp." had some problems. A separate Space Control Corp. was formed, and this served as an assembly and sales organization; Zel Ritchie then combined his Ritchie Products with the new corp. and became its head. Despite the discouragement of skeptics, Zel enthusiastically promoted the new, radically different system. Remember, no one else had proportional; with our manufacturers, reeds reigned. However, Zel was a top pattern flier and his competitive flying did much for the Space Control image.

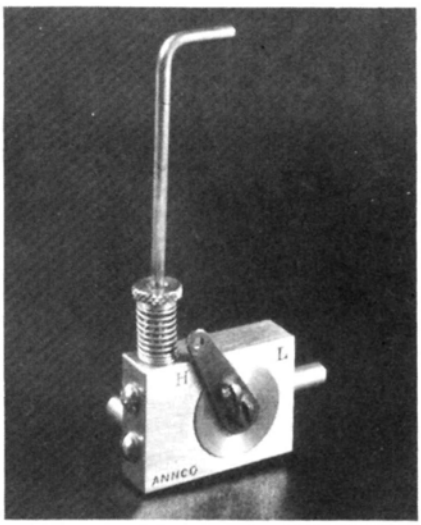
I first heard of Space Control in a Dallas Nats report. Problems had kept me away from that early Nats, but Zel was there, hoping for the best. Apparently, on one flight, his model flew *into the ground.* On impact, a great cloud of "smoke" billowed up, and someone yelled, "Did you see the explosion?" In reality, the trouble was created by a problem that was common in those days. Dallas was as hot as usual (if not hotter!), and many of the electronic components were temperature-sensitive. At over 100 degrees, the temperature bothered the Space Control, and Zel's solution was to pack dry ice around the receiver just before takeoff. Obviously, it didn't cure the problem, and the "smoke" was actually *vapor* from the dry ice! If nothing else, Zel's disaster added some flavor to that Nats and caused Zel to go back to the drawing board. All lessons had to be learned the *hard* way!

Your intrepid author with his Space-Control-equipped Viscount at an early '60s Nats; S.T. .46 powered.

After that Nats, throughout the media and industry, there was much talk about the advent of proportional systems. Even reed manufacturers thought propo would soon be "the thing," so I listened and studied as much as I could. When the flying season closed, I decided to order a Space Control, so that I could have a first-hand look.

It arrived during a typical Buffalo January—snowy and so-o cold! As you can imagine, bolting the "red brick" into an available L.W. Pursuit was simple but exhilarating—all sorts of anticipation!

The inclement weather allowed ample time for familiarization, and then the waiting was almost unbearable. Finally, a forecast in early February seemed to offer hope of flying. Friends Jack Roth and Ron Chapman were notified, and, on a bitterly cold day, we loaded a heated station wagon and went to the field, our objective being to get the first feel of proportional control. In retrospect, what we did seems simplistic, yet our experi-



A commercial two-speed device for engine's controlled fuel flow. Switched from a lean to a rich mixture.

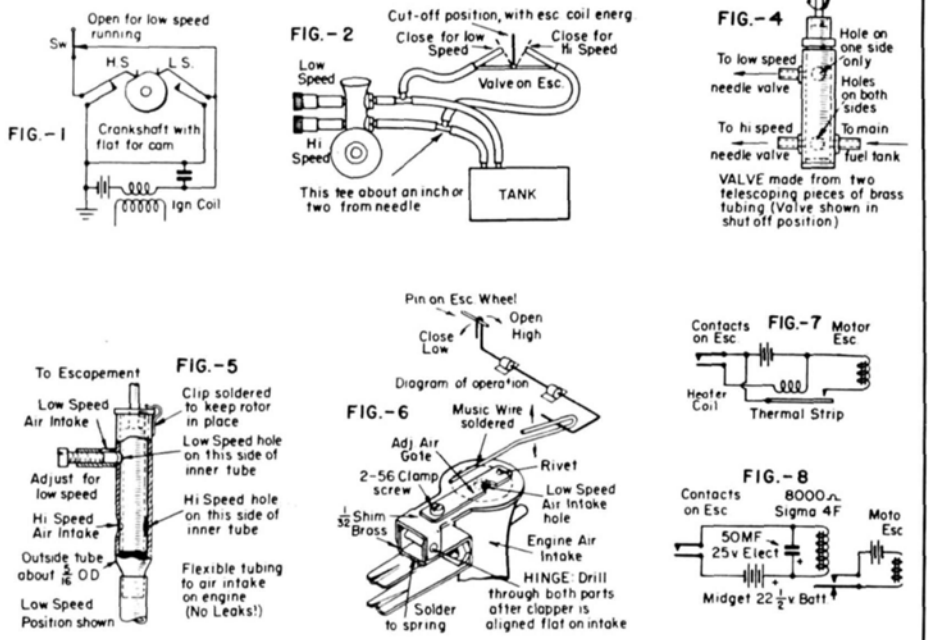
L.J. Fondots, Boyertown, PA, with Kazmirski Orion replica. Performance matches modern designs; landing ability a special pleasure. Kaz's red, white and blue colors and trim.

ence changed the future of R/C for us.

Our first Space Control flight amounted to two laps around the field and a neat landing. Even during this short test, the difference between propo and reeds was so marked that it was hard to believe; it had the feel of a full-scale plane! Another flight proved that the precise control was for real! One point seemed obvious: To get the most from propo, we'd have to forget our reed habits and practice with it. With such easy flight, practicing was a welcome chore.

I immediately decided to give up reeds—quite a major decision, considering I was a very accomplished reed modeler/flier. The beauty of what I'd seen in those two short flights in adverse weather, plus the realization of what was to come, convinced me that it was time to put all my efforts into proportional modeling. Others thought the same when they first tried propo, and the popularity of reeds quickly faded.

Motor and Auxiliary Controls for R/C



Early R/C engine-control devices. (Details in text.) From Hobby Helpers publication.

E.J. Brown of San Diego, CA, concocted this speed control in the '50s. Apparently varied air intake on his ignition Arden .19 converted to glow.

Those were exciting times: Designing, building and flying with Space Control. I could hardly wait for the weather to improve so that I could fly it again, and many local fliers also switched to Space Control.

However, all wasn't sugar and spice. Like most radically new things, S.C. had its growing pains. With use, it soon became obvious that the amazing toroid coils weren't immune to vibration. Also, the embryonic transistors weren't as reliable as those we have today. Malfunctions were all too frequent, and since we wanted to keep flying, this "down" time had to be circumvented. Fortunately, Zel Ritchie was most cooperative, giving us over-the-phone diagnoses and possible solutions, until he'd taught us how to handle the problems ourselves. One episode must have set a repair-time record. One morning, we took a system to air express, it traveled to California, Zel repaired it and put it on a return plane. We picked it up the *next afternoon* and were flying again that evening! Propo flying was so outstanding, there was nothing we wouldn't do to continue.

The difference between proportional flying and reeds was so dramatic that it took some time to learn how to get the most from it. Eventually, it became obvious that advanced aerodynamics could be used to adapt the planes to this new ability, and with this in mind, the first Live Wire kit—the Viscount—was produced. This design drew on experience gained with Dunham's Voltswagon, but it was simple enough for the average R/Cer.

Apart from the very *first* R/C flight, I

(Continued on page 99)

DYNAFLITE

PIECE O' CAKE

ARF

THIS ONE REALLY LIVES UP TO ITS NAME, ESPECIALLY IN FLYING.

DYNAFLITE*, for you newcomers to the R/C fraternity, is the result of the joining of the forces and resources of three well-known modeling concerns: Marks Models, Craftaire and Jemco. Their individual product lines range from some very nice sailplane kits through some equally nice sport-scale and precision-scale offerings, along with some interesting products like electronic goodies.

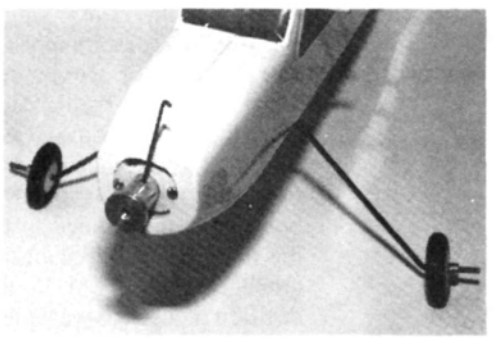
by RICH URAVITCH

Below: *Classic launch has Nick Ziroli Sr. providing the "Armstrong" technique while Nick Jr. controls the sticks. (Thought the kids were supposed to do the running?!)*
Left: *Wings level and motor off, the P.O.C. floats by the camera for a gentle touchdown.*

One of their more popular kits is the balsa built-up version of our review airplane, the Piece of (or O') Cake. To my knowledge, it's Dynaflite's first venture into the exploding ARF market, and their approach has some unique aspects. One of these is the fact that this "kit" is electric-powered and utilizes the popular Mabuchi 540-series motor (in one form or another) as its powerplant. It will come as no surprise to many of you that this is the same series motor almost universally used in the R/C cars that have become so popular.

The 29-step, illustrated instruction book, while covering the basic assembly sequence, will probably present some problems to the R/C car enthusiast attempting to "cross over." Most of these problems will be in the area of equipment installation; it's tight, requiring both planning and some "surgery." More about that later.

ASSEMBLY: The kit itself is nicely and protectively packaged. The wings, fin, rudder, stabilizer and elevator are balsa and are supplied pre-covered with heat-shrink film of the Coverite* Black Baron variety. The wing is supplied in two panels that are joined by a steel rod dihedral brace. No adhesive is used, and this is great for transporting, because you can separate the panels when you've finished flying. I liked this feature, and I added a pair of 1/16 dowel "anti-rotation" pins that key the panel together at the same angle of incidence. If you have the space for storage, remove the covering material from the root ribs, install the joiner and glue the panels together permanently. While you're working with the wing panels, remove some covering from the trailing edge where the hold-down rubber bands cross it, and add some thin plywood pieces to prevent the rubber bands from cutting into the balsa.



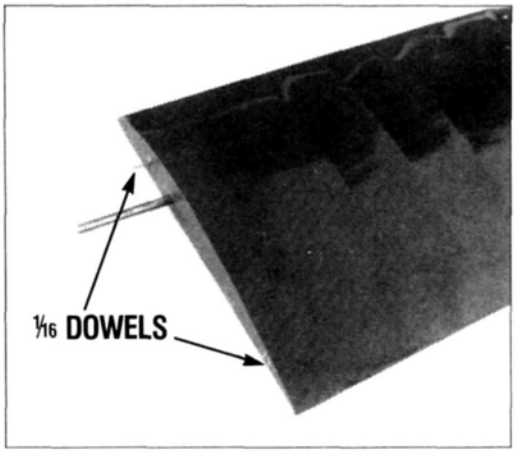
The machined-aluminum prop hub adapter is secured to the 540 motor by an Allen setscrew. Loctite will keep screw in place.

The fuselage consists of two vacuum-formed polystyrene halves that are pre-joined around a small number of light-ply internal structural members, like the motor mount, battery floor and servo tray. The landing-gear struts are pre-formed music wire and they plug into pre-drilled holes in the fuselage and are retained by a small rectangle of polystyrene sheet. This same type of plastic sheet is used for a battery-hatch cover and is retained by three No. 2 sheet-metal screws.

There's no mention of attaching the prop hub adapter to the 540 motor, but since the prop, retaining screw, washer, adapter and Allen setscrew were packed in the

SPECIFICATIONS

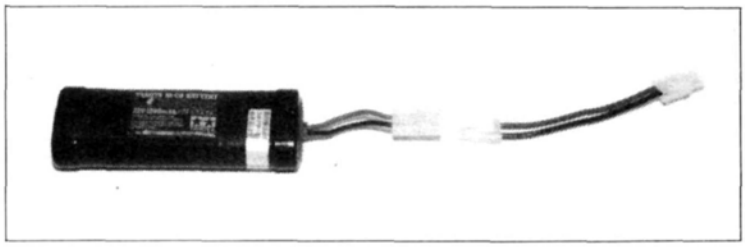
Type: *ARF trainer/powered glider*
Wingspan: *76 inches*
Weight: *64 ounces (4 pounds)*
Wing Area: *565 square inches*
Wing Loading: *8.8 ounces per square foot*
Power Required: *540 electric*
No. of Channels Req: *Minimum of two*
Suggested Retail Price: *$164.95*
Features: *Pre-covered wing, vacu-formed fuselage. Available with or without motor.*



A pair of 1/16 dowels was added to the root rib of the right wing panel to prevent rotation around steel rod joiner. Left panel root rib has holes drilled in it to receive dowels.

same bag, it was pretty obvious what was required. Just make sure you bottom the setscrew against the flat spot on the motor shaft.

All of the assembly, to this point, consumed only about three hours. Our review kit was the "deluxe" version and, as such, had the motor not only supplied, but also installed. This installation included an in-line fuse, safety switch and a microswitch to provide a motor "full on" or "off" capability. I used a new Cox* Cadet III, 3-channel radio with a servo each on rudder, elevator and "throttle." This throttle arrangement consisted of the microswitch being "Zapped*" to the servo in a position that caused the switch to be closed by the servo arm at full throttle. The fuselage radio compartment was now occupied by a receiver, airborne battery pack, three servos, a microswitch, a fuse and a motor safety switch. See how crowded it's getting—quickly? All of this is located above the 6-cell car battery that supplies the juice for the 540!



Standard 6-cell R/C car-type battery pack is used to power the motor. Tamiya pack shown required adapter harness to mate with Kyosho connector supplied with P.O.C. kit.

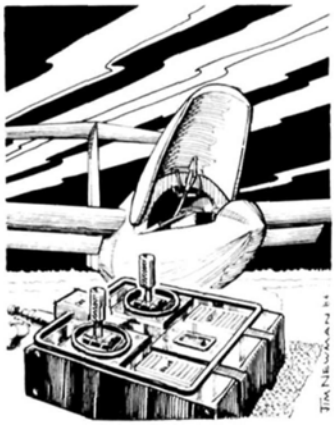
OK, the last thing—decorating! To appreciate the self-sticking "decals," you'll have to be either 14 years of age or an ardent MTV viewer; neither category applies to me. I did, however, use the "windows" and my favorite celebrity canine, Spuds, with *his* Piece O' Cake, to decorate *my* Piece O' Cake! A stripe on the fuselage seemed right, and that finished the assembly portion.

To check the CG, I installed a Tamiya* 6-cell car racing pack, and strapped the wing into place. The P.O.C. balanced slightly nose-heavy at the recommended balance of 2½-inches aft of the leading edge. That was just fine, so I didn't add additional weight. Now that everything was just about right, I decided to plug everything in, check the controls and fire up the motor for "break-in." Surprise! My Tamiya battery wouldn't connect to the Kyosho* connector supplied with the motor harness. No biggie! Down to the hobby shop to buy the appropriate adapter harness. (Or make one, if you have the connectors on hand.) Now, we're really ready, so it's out to the field for the test hop.

PERFORMANCE: I was greeted at the South Manor Flyers field by the omnipresent Zirolis, 20-knot winds, and some genuine trepidation about the wisdom of the adventure, but I'd brought along two fully charged packs and was bound and determined to try this thing. Some semblance of intelligence emerged in the decision process, as we waited until later when the wind became steady and slightly less intense.

(Continued on page 102)

Temporarily unchained from their desks, members of our editorial staff enjoy posing with this plane. Left to right: Katherine Tolliver, Sara Clarke, Lynne Sewell, and Li Agen. Lurking in background: MAN *Editor, Rich Uravitch.*



Quiet Flight

by JOHN LUPPERGER

MOST GLIDER CLUBS are organized for two main reasons: to locate and keep a flying site for a group of individuals and to facilitate the friendship of fellow gliders. This is usually accomplished through the exchange of ideas at meetings and at club contests. As a matter of fact, it seems that most of a club's activities revolve around the monthly contest, where you get to see what the other members have built and how well they've improved their flying skills. It's a chance to help a beginner, or to pick up some tips from one of the best pilots. Soaring—the friendly fraternity!

Fall Soaring Festival

Ever ask yourself why some modeling events are more successful than others, or why you mark your calendar a year in advance so that you won't forget the date?

Well, the Central Valley R/C Club of Visalia, CA, puts on this kind of event. This year marked their 15th Annual Fall Soaring Festival. The CVRC group closes the entries at 150, and word was that, this year, they returned over 100 entries after filling their quota. What can make an event this popular?

Their winches weren't the strongest, their field wasn't the biggest, the contest didn't run without hitches, and their landings were difficult, but the CVRC is a friendly group who try hard to make sure everyone has the best possible time.

I would have liked stronger winches, but one was always available when you were called upon to fly. There were quite a few obstructions around the field, but not too many planes found them. When there was a dispute or problem, it was dealt with fairly, and the decision was final. The landings are the hardest I've ever seen. Every year they come up with a new landing that will give even the most stouthearted glider guider nightmares. If you think I'm kidding, just look at the drawing. In two days and six rounds of flying, there were only six 100s in the top 10 finishers' scores (and the top 10 finishers were about the only ones to score 100s).

Dean Aldingez flew his Ultima at Visalia. Dean built it in a two-week building marathon, just to get ready for the Fall Soaring Festival.

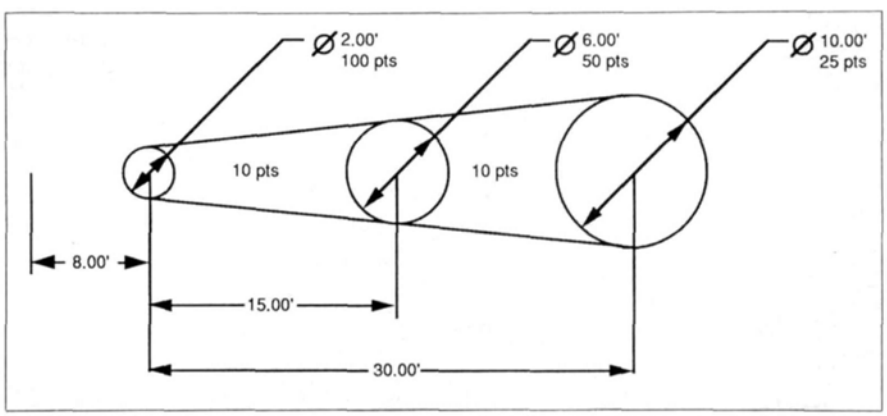
Not all of the activity was limited to the flying field. After a big Saturday-night barbecue, there was a live bluegrass band that entertained everyone for a couple of hours. Then, to top it all off, the CVRC gave out beautiful burl wall-plaque trophies (sure wish I'd picked one up—oh well, *next* year). I've already marked my calendar for the first weekend in October 1989.

Models at Visalia

Usually, when you attend an event as big as the Fall Soaring Festival, you see some new and interesting models. I found two very interesting models: One was scratch-built; the other was built from a kit.

Vernon Oldershaw (designer/builder)

(Continued on page 52)



The landing plan for CVRC's Fall Soaring Festival destroyed many pilots' hopes for a trophy. If you don't think it looks that hard, try it at your next club contest.

(Continued from page 50)

and George Gillburg were both flying a really sharp-looking flying wing, which doesn't have an official name yet, but will have one before it's published. Yes, I got Vernon to agree to draw the wing and do a construction article. (If Vern comes through, the editor has agreed to print it.)

Vern's wing has four functions: rudder, elevator, ailerons, and top and bottom spoilers. Vern and George both fly their wings with the ailerons and rudder coupled. During the contest, I watched several of their flights and was quite impressed with the wing's performance potential. They launched as if they were on rails and thermaled very well. The span is 3 meters with a wing area of 1008 square inches; the wing loading is 8 ounces per square foot, and the airfoil was developed by Vern. By the way, Vern is definitely qualified to design such an unusual soaring machine; he was the main design engineer on Paul MacCready's Gossamer Condor. (Watch for the construction article in a future issue.)

The second model was an Ultima kit built by Dean Aldingez. I'd seen the Ultima in Bob Sealy's booth in Toledo last year, but this was the first time I'd seen one fly. Dean had basically built the Ultima stock, except for filling the tail boom and vertical fin with expanded foam, because he felt that it needed to be stiffened up. However, this did raise the wing loading to 11 ounces per square foot. The Ultima uses the Selig 4061 airfoil, and it seemed to perform really well. Dean's model had rudder, elevator, aileron and flaps. The rudder and ailerons were coupled and the flaps had automatic elevator compensation.

On one launch that I observed, Dean had a problem, and the plane dove for over 100 feet on the line. When it came off, Dean was only a couple of 100 feet up. After getting things under control (a problem with the radio mixing functions) it looked like it was going to be tough for Dean to make the necessary eight minutes. However, the Ultima proved itself to be an excellent thermal machine. Dean hooked a small thermal, worked it until it started to break, and then "skied out." From what I saw, I think the Ultima may end up being a real threat at future events.

Project Wanderer

This month, I'll build the center-section spar and wing section. Next month, I'll finish with the tip panels and spoiler installation. I'm sorry it's taken so long to finish this project, but outside interests (such as a full-time job) and column space have dictated that it stretch out over several months.

If you prepared the ribs according to the last installment, we'll begin with Step 9 of the Wanderer's instructions for wing construction. Prepare the plan by covering with wax paper. Pin the trailing edge and leading edge to the plan according to instructions. Before continuing, you must build the full-depth spar. Start with two

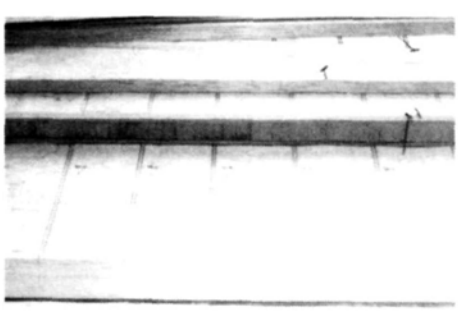
Vernon Oldershaw and George Gillburg flew their great-looking flying wings at Visalia. Vern has agreed to do a construction article for MAN; *watch for it in early '89.*

48-inch lengths of ¼x⅛-inch spruce spar material. Mark the center of these spars and line up this mark with the wing center. Cut sufficient vertical-grain shear webs from ¼-inch balsa sheet at 9/16-inch height for the entire spar length. Using either Slo Zap* or, preferably, aliphatic resin glue, start gluing shear webs to the lower spar, making sure that they remain exactly vertical. Glue the shear webs along the full 48-inch length. To complete the spar, glue the second spruce spar to the top of the shear webs. Set aside and allow the glue to cure.

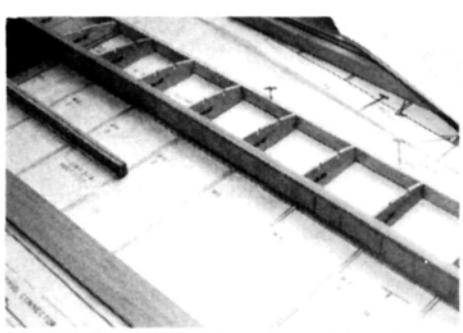
Pin the finished spar into place, making sure that the marked center corresponds with the center of the wing. Cross pins over the spar: do *not* pin through the spar or shear webs. Position the 10-inch root spar, and cut the center sheeting and install it according to instructions. Make sure that the spar, leading edge and trailing edge are flush with the building-board's surface.

Since we're going to build the center section flat, don't install the first W-1 rib

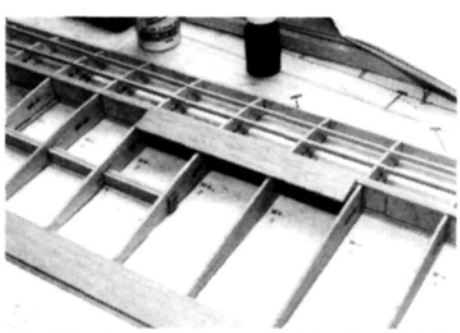
(Continued on page 107)



The full-depth sheared spar for the Wanderer is made of two 48-inch spruce spars and ¼-inch vertical-grain balsa shear webs.



In this shot, the front sections of the ribs are glued into place. The notches for the turbulator spars and the rib identification can easily be seen.



The Wanderer wing starts to take shape with the rear rib sections glued into place. Turbulator spars and spoiler blade are shown for future positioning only.

by RICH URAVITCH

Photos by Rich Uravitch

THE NEWEST CAP IS ALSO NEW IN THE MATERIAL DEPARTMENT, FEATURES MOLDED FUSELAGE

KYOSHO CAP 21

The CAP is very "comfortable" in inverted flight; very little down-elevator required.

JUST WHAT WE need, right? *Another* CAP 21, and another ARF, besides! Let me first assure all you scratch-builders out there that this isn't an attempt by all the manufacturers and importers to make it difficult for you to pursue that which turns *you* on in the hobby. I've talked about the value of the ARF before, so I won't go into it here, except to say that they're a modeling fact of life: They're here to stay, and if there wasn't a demand, there wouldn't be a supply.

So what's different about this one? A lot of things; but before I get into the specifics, let's think about just how many forms of almost-ready-to-fly types there are, in terms of construction and materials. They range all the way from the vacuum-formed,

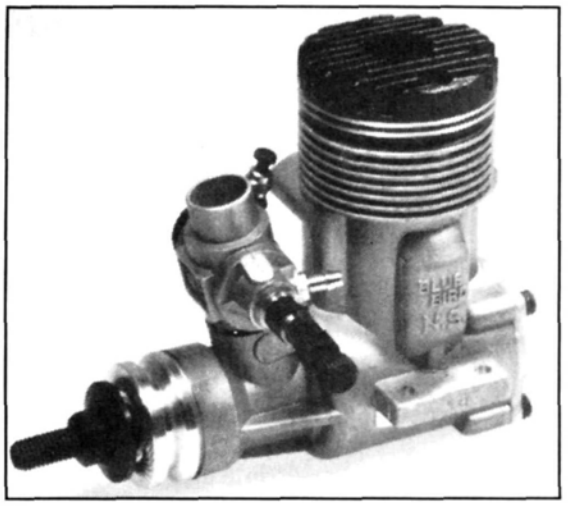
SPECIFICATIONS

Type: *ARF, Sport/Scale*
Span: *58½ inches*
Weight: *(review airplane) 86 ounces*
Area: *590 square inches*
Wing Loading: *21.5 ounces per square foot*
Power Required: *.40 to .45, 2-stroke; .60, 4-stroke*
Number of Channels Required: *4*
Suggested Retail Price: *$299.95*
Features: *Molded fuselage, wheel pants and cowl; built-up, pre-covered, balsa wing and tail group; extensive decal sheet; excellent instructions.*

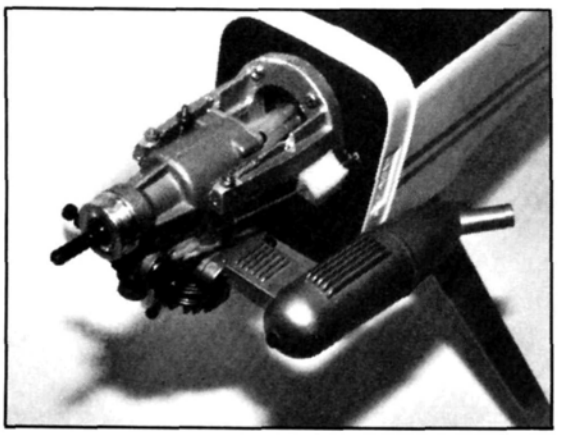
all-plastic varieties through injection-molded foam, right on to mostly balsa built-up, and even some fiberglass and foam. What have the major resistance areas been? Usually, initial cost and repairability head the list. A lot of that has changed, with more economically priced ARFs arriving daily from foreign shores. Many are of built-up wood with plastic covering, which answers the repairability issue handily. With this CAP (and with a number of its earlier electric-powered birds), Kyosho* has taken the repairability aspect one step further. The wings and tail feathers are our old friend, *balsa*, and the fuselage is plastic. Aha, you say; if it's the Kyosho material I'm familiar with, repairing it is about as possible as getting a rebate on your 1989 AMA dues! Probably true, but if you don't damage it, the requirement for repair goes away. That might have been Kyosho's philosophy when it selected this rotational-molding process that turns a polyethylene-type material (like some fuel tanks) into a sleek, nearly indestructible fuselage. This could create some minor problems, especially in assembly! Ever try to glue anything to a molded fuel tank? If you have, and were successful, tell the rest of us. I've tried CAs, silicones, epoxies, hot melt and other lesser-known adhesives—none particularly tenacious.

Kyosho solves the problem in the CAP by using mechanical fasteners (screws, nuts and bolts) to attach everything. For example, the horizontal stabilizer is held in place by two long screws at the base of the vertical fin, and these penetrate the top of the fuselage, the horizontal stab and the bottom of the fuselage, and they're secured by two acorn nuts. I'm an insecure person, so after I'd completed this step, I ran a bead of Pacer Technology's* Zap along the edges. It won't stick as well as I'd like, but I feel more comfortable about it. But I'm getting into assembly, and I haven't yet told you what you'll find in the kit.

Plans aren't required, so Kyosho thoughtfully omits them and substitutes a well-illustrated, 12-page assembly manual. Assembly, radio installation, adjustment and control throws are broken down into 22 steps that are easy to follow and shouldn't present any problems. A nice touch is the inclusion of a small illustration of the hardware required for each step, so you'll be sure to select the right piece. I've already mentioned that the wing and tail feathers were built-up wooden structures, pre-covered with a white Mylar-type material (probably heat-shrinkable, but I haven't yet had the need). The only other wood in the kit is the ply that's used for the fire wall and reinforcement of the landing gear and wing attachment points.



The Aristo-Craft Blue Bird .46 is a rugged, well-built powerplant with more than enough power for the CAP.



Although mounted inverted, the engine was easy to start. Mount drilled to accept engine directly, rather than clamping arrangment. (See text.)

ASSEMBLY: The hardware package is complete and includes, in addition to the fuel tank, engine mount, and wheels, all the other required bits and pieces. Remember, this thing *screws* together!—except for the wing, which consists of two panels that are joined using epoxy and ply center-section spars. Even the 30-minute-cure epoxy is supplied. Mine must have been the experimental, lightweight variety, because when I squeezed one tube, all that came out was air! That's the only thing that was missing.

The metal engine mount uses two brackets to clamp the

Servo position is pretty much predetermined, due to method of attaching tray with screws. Fairlead added later to support wire portion of rudder and elevator pushrods.

engine into place. I'm certain that this system works just fine, but since I was going to use a relatively lightweight 2-stroke .45, I elected to drill and tap the mount to position the engine as far forward on the mount as possible to compensate for what I viewed as a potentially tail-heavy airplane. More about that later.

The radio and control-surface installation are covered thoroughly, but, because of the screw-together process, you don't have any latitude in positioning components to adjust the CG. The supplied hinges are a bit stiff and should be flexed before installation so the servos won't have to work as hard. I also had to deepen the pre-cut hinge slots in the surfaces to allow the hinges to be properly positioned.

The final step in the assembly process is the application of the extensive array of self-adhesive decals. Not wanting *my* CAP to look like every other one the field, I took some liberty with the placement and scheme—didn't affect the flying at all! While involved with all the personalization, I added a Rich Uravitch signature model-pilot bust to fill the space under the canopy.

I checked the CG, using the aft recommended location (120mm from the leading edge at the center section), added a 2-ounce spinner weight and put the CAP on charge for the next day's test hop.

PERFORMANCE: Ever get a feeling of nonchalance when it comes to putting the first flight on that new bird? Sure you do! The weather's perfect, your wife treats you to breakfast in bed and helps you load the car for the trip to the field, lovingly saying, "Have fun, dear; take your time; enjoy your new airplane!" as you drive away, "at one" with your model. OK, back to reality—I arrived at our field somewhat later in the day when the usual gang was on hand. After the usual, "That looks great, Rich. Did *you* build it?", or, "Rich, don't you build anything anymore?", I decided to silence the unruly mob by firing up and flying. Remember that Aristo/Polk's* BlueBird .45 I mentioned? I think it's a .45—that's what the box says. The engine has ".46" stamped in the case, but no matter, it started immediately by hand-propping, even though it's mounted inverted. With a 10x6 wood Zinger* prop, it easily turned 14,400, and I have a feeling it will get even better. I like the muffler arrangement, which lets you rotate the exhaust outlet to any direction you choose. I'd prefer something a little quieter—it's only about average in the noise-abatement department. As is often the case, I enlisted the skilled fingers of one of the Zirolis (Nick or Nick Jr.) for the first flight, so I could get flight shots. Nick Jr. got the nod, so we checked the CG again (still a bit of a concern), refueled, fired up and took the active.

Williams Bros. pilot dresses up cockpit area. Servos are mounted just forward of pilot; looks like instrument-panel glare shield.

Nick Jr. started the takeoff roll by applying power gradually. In what seemed to be less than 20 feet, at full power, the CAP leaped into the air and hung there, and only through quick reflexes and sheer engine power, managed to remain airborne in an obviously tail-heavy condition. Needless to say, no pictures!

Back on the ground, after any number of I-told-you-so-type looks, I added an additional 3 ounces to the nose, bringing the total to 5 ounces. Flight number one (we don't count the first circuit!) was entirely different. The CAP trimmed right up and we soon had it all sorted out and doing just what it looked best doing—aerobatics. The force arrangements are such that it takes very little down-elevator to maintain sustained level flight while inverted. The big rudder helps in the knife-edge, but it's a bit difficult to maintain it for long. Snap maneuvers are crisp, with a little tendency to overshoot on the recovery, but this is probably due more to pilot technique than to airplane shortcoming. Landings, however, have to be considered beautiful. With some practice, you can hold the nose off and put the CAP precisely where you want it every time. I haven't yet been able to full-stall land it, and probably won't, because it's very clean and prefers a little speed at touchdown, but "wheelies" look great also!

The Kyosho offering, while it's the newest CAP out there, shouldn't be considered "just another CAP." It's unique in fabrication and materials, it flies very well, and it will probably prove to be extremely durable in service. The more experienced flier will enjoy what it has to offer in performance, and the progressing novice can latch onto an airplane that he can grow with.

**Here are the addresses of the companies mentioned in this article:*

Kyosho; distributed by Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.

Pacer Technology & Research, 1600 Dell Ave., Campbell, CA 95008.

Aristo-Craft/Polk's Model Craft Hobbies, 346 Bergen Ave., Jersey City, NJ 07304.

Zinger, distributed by J&Z Products, 25029 S. Vermont Ave., Harbor City, CA 90710. ■

SCALE MASTERS

(Continued from page 32)

together for a competition that would produce only one winner, a lot of also-rans and one last-place finisher. It was pretty much understood that there would be no losers!

I spent a couple of hours hustling around, taking pictures and jotting what notes I could. It's amazing how many of the Californians use a Webra Bully. Diego Lopez has one in his Lien Hellcat, and it pulls the 25-pound bird around as though it were a feather. The same goes for Shailesh Patel with his Baker P-47 and Denny DeWeese with his Lien FW-190. They fly Bully engines and their ships both weigh in the 25-pound range. Everyone used a Zinger 18x6-10 wood prop and tach at 7200rpm for maximum performance without overheating. Bob Frey drove in from Arizona with his 62-inch P-47 constructed from Bob Holman plans. Bob's Tigre .75 weighed only 10 pounds and was entered to prove that you don't have to have an 80-inch bird to be competitive. (He may have a point!) Bob's partner in crime, Al Casey, brought his MIG-3 along, and it, too, is a little small at 72 inches and 11.5 pounds. The MIG, in particular, would look outstanding at 82 inches in a winter camo scheme!

Of all the smaller-scale models there, Bill McCallie's FW-190, built from an old Jerry Ortega kit, was the only design with enough mass to have the presence needed at this type of competition. A few people used the Super Tigre 3000 in 22- to 27-pound airplanes. Bill Carper entered one of the prettiest Baker P-47s we've seen, and the 3000 hauls the 23-pounder around with a lot of authority; the same goes for Gene Barton's red P-51. The Mustang tips the Toledo at 26 pounds, but you'd never know it.

Very few used gasoline engines this year; in fact, if my notes are correct, only Chuck Fuller's Sachs-powered PT-22, Frank Pring's Sachs-powered T-6, Gary Ponnell's Sachs-powered Stearman and Olan Trenary's Zenoah-powered Chipmunk were non-glow entries. One of the prettiest Cubs we've seen since last year's Masters was the Sig ¼-scale version brought out by Mark Harrell. He did a good job of building and flying and, once again, proved that you don't really need a military model to do well. Don Hatch came in from Canada with his Cessna AG Truck and grabbed top static for a civilian entry. He narrowly beat Bob Wischer's Mailplane with a 94.5 score. John Guenther and Denny DeWeese showed us how two people at different ends of the country can get hold of different documentation for the same airplane and field two absolutely different-looking airplanes that are both correct according to AMA rules. However, John had the actual German colors, and Denny had some shades that were the figment of some artist's imagination! A neat little Royal DC-3 was almost overlooked, and I'm sorry I didn't get more info on the model, especially since it wound up surprising a lot of people by doing very well. Again, the rules were in the airplane's favor, and the builder, Bill Miller, had done a beautiful paint job. Once again, Bill proved that you don't need a fighter to do well!

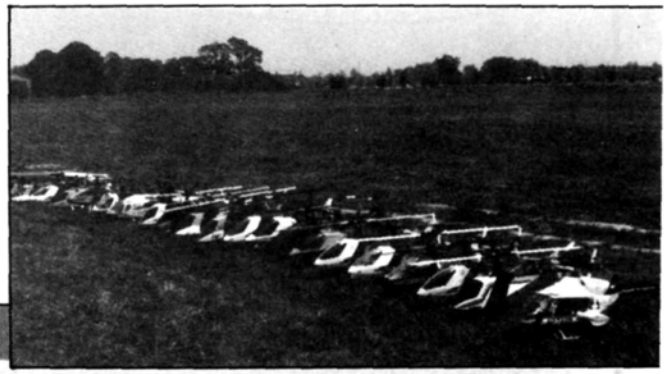
One of Canada's best modelers, Jerry Fingler, entered an 82-inch Cessna Bird

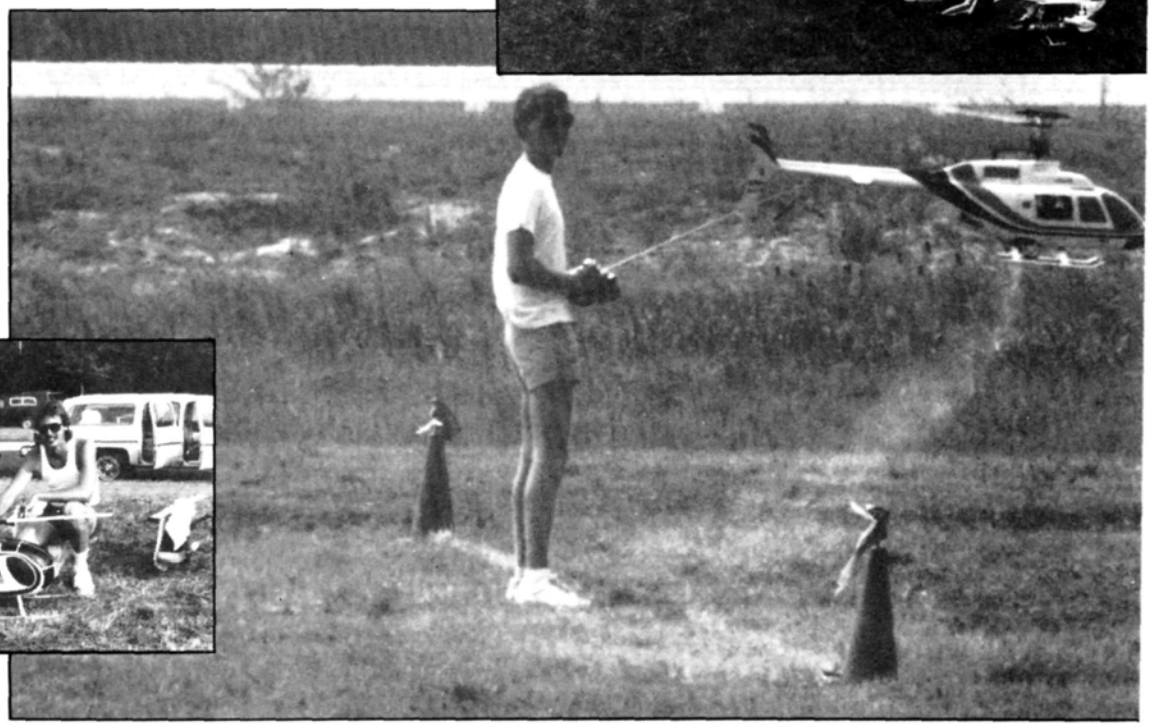
(Continued on page 82)

1988 AMA HELICOPTER NATIONALS

by ROBERT DUNKIRK

Largest Nats Heli Turnout Ever





Left: *Dan Chapman showing Dad's 1st-place Scale winner, a Hughes 500 D.*
Above: *Line-up of G.M.P. helicopters, which dominated the meet, followed by X-Cells.*
Center: *Curtis Youngblood had a plug burnout in his first round.*

THIS YEAR,THE AMA National Championships were held in Tidewater, VA. It was 7:30 a.m. on August 23, when I pulled into Fentres air base, headquarters of the Nats, to register. After driving all night from Manhattan, and being a little dazed from an eight-hour drive, the first person I talked to was Geoff Woodward from Australia (and I thought *I* had a long trip!), who said he'd spent $1,600 on airfare. Now that's what I call enthusiasm! Geoff had a unique radio problem that kept him from competing during the first two days. His JR Galaxy, bought in Australia, used a frequency that wouldn't work in this country, but he managed to borrow what he needed and did a very respectable job flying FAI.

After registering, I had my radio frequencies checked out at the Holiday Inn headquarters. Even though I was feeling sleepy from my trip, I just *had* to drive by the helicopter field to see where we'd be competing. To my surprise, there must have been at least 45 chopper pilots checking out their machinery and getting in some last-minute practice. It was hard to drag myself away, but the heli pilots were expected to be at the competition site by 8:00 the next morning, so a good night's sleep was in order.

The next morning, I arrived early to find the helicopter flying site already buzzing with activity. Tents were being hammered into place, chopper support equipment was being set up, and at least a dozen machines were already in flight to check their trims and fine-tune their engines. The judges were being briefed by Horace Hagen and CD Dwayne Stevens. A crew of men and women was at work at the transmitter impound, while the computer equipment was being set up for official scorekeeping.

The first meeting called was for the FAI pilots (Expert Class) who were to start the day's competition. Next were the Intermediates, followed by the Novice Class. According to Horace Hagen, this year's meet had the largest turnout ever. Last year, there were 39 helicopter contestants, compared to this year's 76. The Novice division alone, with 33 pilots enrolled, showed the growing interest in helicopter competition.

The weather was in our favor: bright sunshine, very hot and an occasional hefty breeze, but not enough to cause serious flying problems. The wind did put a nervous edge on the scale pilots, so their flying time was altered to take advantage of the most favorable flying conditions.

The wind played havoc with this scale Bell 222, but the damage wasn't serious.

With hundreds of hours of work on these scale ships, this was a very reasonable decision.

While watching the scale event, I couldn't help but notice the amount of attention these beautiful ships always seem to attract. People love to watch these magnificent machines fly, yet there was only a handful of entrants in this category, so it's in great need of the scale craftsmen that I know are out there. The three winners this year definitely deserved their trophies, but, without a doubt, this event could stand much more participation.

A new set of maneuvers was flown by all FAI pilots this year. In the past, pilots flew a prescribed set of maneuvers and then a set of their own choosing. This manner of competition was very difficult to judge. To be fair to all competitors in FAI, it was decided that each contestant fly exactly the same maneuvers, thus allowing the judges to accurately assess each pilot's proficiency.

This year, the FAI competition was keen indeed, with many well-known names and most of the best pilots flying their R/C helicopters. At first, I felt the FAI judges were very harsh in their judging, but when I saw the level of flying skills they had to grade in FAI, I began to understand their need to be critical. The only problem was that this very critical judging seemed to "bleed into" the novice scoring, and I'd like to see these FAI judges use the entire 10-point scale when scoring the novice manuevers. Maybe they thought that if any more than six points were given, that contestant shouldn't be flying Novice Class! (At least, that was the best reason *I* could come up with!) That was the only complaint mumbled by some of the contestants. Regardless, everyone in the Novice Class was judged by the same criteria, which made it fair. Since I'd rather be flying than judging, my hat is off to these hard-working people.

(Continued on page 62)

Weldon Freeman took 3rd place in Scale with his Bell 222.

The Russian Hind 24D, built by Mike Robbins took 2nd place Scale. Used a Larry Jolly plug.

Dave Carter's Jet Ranger X-Cell with Quick Silver X-Cells in background.

AMA HELI NATS (Continued from page 59)

FINAL STANDINGS

FAI
1 Cliff Hiatt
2 Ted Schoonard
3 Tim Schoonard
4 Curtis Youngblood
5 Dave Youngblood
6 Robert Gorham

INTERMEDIATE
1 Wes Suggs
2 Jim Himes
3 Lance Murphy
4 Fred Schneider
5 Terry McCurry
6 Stan Stockman

SCALE
1 Don Chapman
2 Michael Robins
3 Weldon Freeman

NOVICE
1 Chad O'Leary
2 Yasunobu Muraki
3 Barry Wehrung
4 Michael Cusanelli
5 Richard Slutz
6 Max Hurst
7 Gary Stonecypher

Above: *Cliff Hiatt waiting his turn with his caller Ted Schoonard.*

Left: *Author with his G.M.P. King Cobra.*

I've always wondered how much practice it takes to be a strong FAI contender. Everyone who has flown choppers knows that one of the biggest problems is keeping the machinery in good flying condition. If the bird breaks down or crashes, it's back to the workbench, and there goes your flying time. That's why I was amazed when Curtis Youngblood (last year's AMA and World Champion winner) said he flies every day, and the Schoonard brothers (Tim and Ted from Miniature Aircraft*) told me they fly twice a day. Dave Youngblood (Curtis' dad) said he usually tries to start heavy practice at least two months in advance of the Nats, and even Datu Ramel (our Chicago friend), who flew the smallest helicopter in the FAI event (a Shuttle), flies three to four days a week.

Of course, the more you practice, the better flier you become. That's fine, but according to my log book, I get an average of five flying days (if that) before some mechanical problem occurs. How do these guys do it? Well, part of the secret is that most of these experienced fliers have at least one extra chopper standing by. The other half of the secret is that they've crashed and rebuilt so many times that they've become master mechanics. Often, they can spot a problem before it becomes a disaster. The bottom line is: If you can't keep 'em flying, you can't practice.

Attending a meet of this size provides an opportunity to see all the latest innovations. Innovative Don Chapman decided to try washout tips on the ends of his main rotor blades. I've seen this done on some full-size helis, but, to my knowledge, no one is producing this type of configuration for R/C choppers yet. Don said he took a set of 1-inch-square blocks (the width of the blade) and glued them to the tip of each blade. He then proceeded to whittle them into shape. The finished product is a set of blades that sits parallel to the earth as all blades do, but at the outer tips, they're rounded off in a downward 90-degree angle to the ground. Don admitted it took a few sets of blades before getting a precise working pair, which had the advantage of more stability in the hovering maneuvers. Don said these blades didn't seem to have any effect whatsoever on aerobatic flight. Both Don and Dan used this configuration exclusively in this year's FAI competition.

Dave Youngblood showed me many of his innovative modifications. He set up dual linkages on almost all of his control surfaces, and he'd also come up with a constant tail-rotor drive to be used in autorotations. I think this type of device might catch on with the new mandatory 180-degree autos now required. Dave used two Gorham Model Products* main rotor gears to accomplish this project. The top part of the gear that drives the tail rotor was cut off from the bottom portion and attached to the main shaft. The remaining gear was cut in the same manner as the first, but this time, using only the bottom clutch-drive portion, with the autorotation device to be placed directly under the tail-drive gear. This setup looks exactly like the standard GMP main gear that's usually used; only when you take a very close look can these split gears be detected. Even with all these modifications, Dave has managed to reduce the overall weight of his choppers to 8.3 pounds. It was great seeing so many new ideas at work. Now, let's get back to the meet.

From the very first round, Cliff Hiatt pulled ahead of the pack with his X-Cell and took the lead. It became immediately apparent to the other pilots that there wasn't going to be any margin for slack in this competition. I wanted to know what

(Continued on page 107)

The UHU glides silently by on final approach. Stylish lines get attention whenever model is flown.

Photos by John Lupperger.

HOBBY LOBBY

ELECTRO UHU

Compact size, 6- or 7-cell pack, folding prop system—complete concept motor glider

by JOHN LUPPERGER

THE GRAUPNER ELECTRO UHU, which is imported and sold by Hobby Lobby International*, is a radical departure from the European norm for electric-powered sailplanes. Graupner, like most of its German and European counterparts, usually produces larger models that use 10 or more cells. At 66 inches, the Electro UHU is small, even by American standards, but its

Above: *The author with his new bird—a proud moment before the first flight. The UHU created quite a stir at the field. Clean lines and smallness got everyone's attention.*
Left: *No matter how you look at it, the UHU makes a statement. It looks like a performer, and it lives up to your expectations.*

SPECIFICATIONS

Type: *Electric sailplane*
Span: *66 inches*
Weight (RTF): *46 to 48 ounces*
Wing Area: *450 square inches*
Wing Loading: *14.7 to 15.3 ounces per square foot*
Motor Unit: *Graupner Speed 600 direct-drive*
Propeller: *7¼ inches Graupner Scimitar-Blade Folding Prop*
Battery: *7.2V or 8.4V; 1200mAh*
Radio Required: *3 channels: rudder, elevator, motor on/off*
Suggested Retail Price: *$129*

Review Model:
Weight (RTF): *46 ounces with 8.4V, 900mAh pack; 47 ounces with 7.2V, 1200mAh pack*
Wing Loading: *14.7 ounces per square foot (900mAh), 15.0 ounces per square foot (1200mAh)*
Radio: *Cirrus PCM 5-channel with two S-133 servos and Graupner BEC voltage regulator on/off*

size makes it a fun model to fly. With only a 7.2V, 6-cell battery pack, the UHU has a climb performance equal to that of most models using gear-drive systems or 7-cell packs (even better than some).

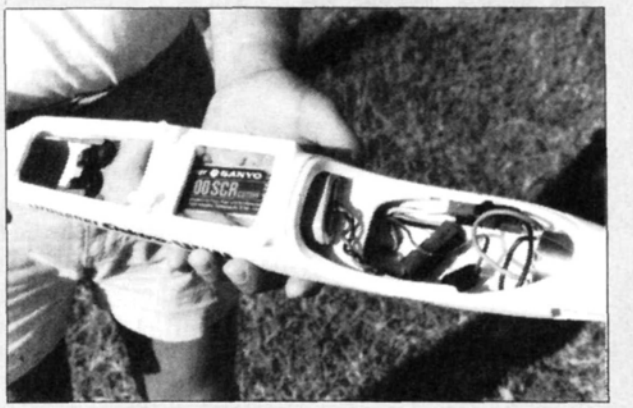
Another really good feature of the Electro UHU is that Hobby Lobby offers a matched motor prop unit, on/off power switch and battery pack designed specifically for it. The Speed 600 motor looks like a Mabuchi 550, but I understand it's made in Germany. After seeing its performance, I have to say that it's stronger than any 550 I've ever seen. The prop and spinner are unique: The 7-inch-diameter prop has scimitar-shaped blades that appear to be extremely efficient, and the backplate for the spinner also houses a collet that serves as the prop adapter. As the prop nut is tightened, the collet grips the motor shaft, so eliminating the need for setscrews, which tend to gall the shaft. The backplate also doubles as the hub for the prop blades.

The BEC (battery eliminator circuit), voltage regulator, on/off unit is something that electric flight has been waiting for! This unit is designed to work with 6- or 7-cell battery packs, and with its BEC capabilities, it eliminates the need for a radio battery pack. This reduces the model's overall weight by 2 to 4 ounces, as the unit weighs 2 ounces—only slightly more than a speed controller, or servo and microswitch.

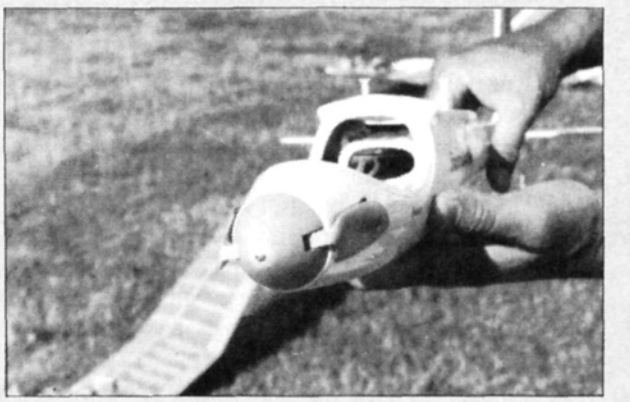
The flight-system battery pack is made of six Sanyo SCR cutoff cells. These cells are rated at 1350mAh, although the pack is called an N-1200. The on/off switch and battery are both wired with 16-gauge wire and Graupner* Molex-type plugs, but these are the only changes I made. All my systems and chargers are wired with Anderson Power Pole connectors (also known as Sermos connectors), so I changed the flight system to this type.

CONSTRUCTION: The UHU can be built as an electric model or as a glider. A plastic nose cone is provided so that you can finish off the front of the fuselage as a glider. A list of the tools necessary to complete construction is provided, as well as a complete list of the accessories you'll need for the glider or electric version.

Construction starts with the fuselage: This is a one-piece,



Although the Electro UHU is a relatively small model, the radio compartment is quite roomy. Good planning and space management are evident in this shot.



These shots show the Graupner folding prop open and folded. The scimitar-shaped blades are extremely efficient and, for minimum drag, they hug the fuselage when folded.

ELECTRO UHU

rotationally molded ABS unit. It's exceptionally strong and not that much heavier than a wooden built-up fuselage. The fire wall is drilled for the motor-mount screws and reinforced inside by a plywood ring. To make final adjustments of the ply ring while gluing, the motor is bolted into place with the spinner mounted. When the glue has dried, the motor is removed, and the battery/servo platform is then slid in through the canopy opening and positioned under the wing. Once in position, the platform is glued into place and the servos are mounted.

The wing-fixing web is mounted at the cross section of the fuselage in the wing-saddle area. This area has a section of the fuselage bridging the two sides, rather than being left open like most wing-saddle openings. The bridge follows the dihedral angle of the wing, and it's where the bolt attachments for the wing are mounted. A plywood web is glued into place under the bridge between the fuselage sides. Between the web and the bridge, two pieces (one for each side) of spruce trailing edge are glued into place, to later accept the wing bolt blind-nuts.

The canopy and cockpit are then prepared for mounting to the fuselage. The vacuum-formed plastic cockpit has a pilot figure and an instrument console. These must first be painted with modeling paints; for a good-looking pilot, remember to use flat paints, because nobody's hair, skin and clothes are as shiny as gloss paints! Trim the clear canopy, and glue it to the cockpit base. Small Fiskar scissors are excellent for cutting out canopies, and I finish them with a sanding block. Following the plans, a piece of trailing-edge stock is glued to the underside of the cockpit. A piece of die-cut plywood is glued to the T.E. stock. It overhangs the plywood by about ⅛ inch and catches on a lip in the fuselage opening. As an additional hold-down, a hole is drilled in the rear of the canopy for a self-threading screw. I drilled this hole, but found that, by itself, the plywood piece held the canopy in place quite securely when slid under the fuselage canopy lip.

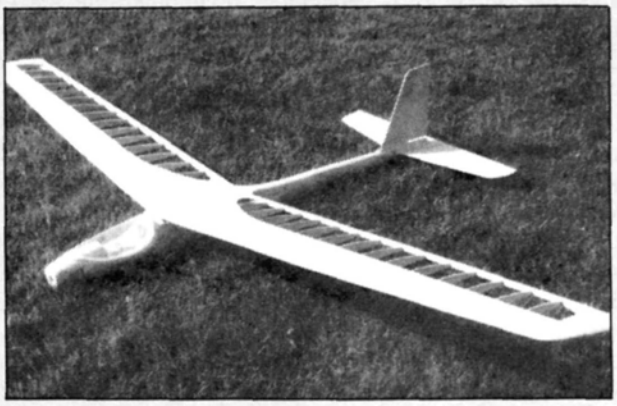
The vertical and horizontal stabs are both sheet and only need to have their leading edges shaped. The fuselage is pre-slotted for both surfaces, and these slots must be contoured with a round file to accept the leading edges. At this point, both surfaces are slid into the slots and marked for future gluing. The pushrods are installed next: The material in the kit is known as Bowden cable, although it isn't actually cable, but is a very small plastic pushrod inside another relatively small outer sheath. However, it works very much like a small Sullivan cable. The horns are glued to the moving surfaces, and these are then taped to the stabs. The elevator and rudder outer-cable sheaths are cut to length and inserted, but not glued, into the fuselage.

The servo-output arms are trimmed, and the Bowden cable is cut to length and fitted with the clevises. When everything is the right length and set for neutral, the outer

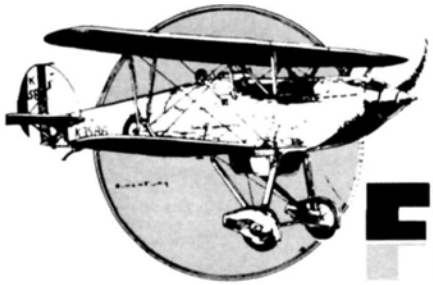
(Continued on page 108)

A lot of attention to detail makes the UHU a very clean model. The elevator horn is at the rear center of the fuselage, where it creates virtually no drag.

Even the air intake and outlet holes are aerodynamically designed for clean air flow.



Even though it's not covered at this point, the UHU is already sleek and good-looking.



Fifty Years Ago...

by STEVE POND

THE JANUARY 1939 issue of *Model Airplane News* brought in the new year for modelers around the world. This information-packed issue featured a wide variety of articles focusing on modeling, modeling organizations and full-scale aviation.

New to the world of model aviation were a number of kits for gas-powered flight in both sport and scale categories. The gas-powered scale craft included the now-famous Rearwin Speedster and the Douglas E-Gull designed for use with a Husky engine. In the sport category, some of the new planes you might have seen included the Comet Clipper, designed by Carl Goldberg (yes, the same Carl Goldberg), the 72-inch Thermal Magnet and the Humming Bird midget gas model from Polk's Model Craft Hobbies. Engines to power these craft were as plentiful as the kits, with new James Motor designs that featured an 11.32cc displacement and ¼hp, the 1939 Trojan from Trojan Miniature Products, the Hi-Speed from Hi-Speed Division—the list goes on.

Articles of interest to modelers of the '30s included "Planning Your Gas Model Prop" by Charles Hampton Grant. Despite the incredible growth that gas-powered flight was experiencing, only a very limited number of manufacturers produced props for gassers. Cutting your own prop was the standard practice, but as the size of the planes and the power of the engines increased, prop design became more critical to optimum performance. Grant's article addressed methods of designing a prop for your particular engine/aircraft combination with reasonable accuracy, instead of guesswork. Imagine if we all had to cut our own props? I think we'd be a little more careful when coming down for a landing (not that these guys had a choice). An article called "The Physics of the Airplane" by Lt. James Eames and Willis Nye (who went on to become one of aviation's most accomplished draftsmen) explained some of the complex forces that act against the airplane during flight. This helped modelers to design their own craft to be structurally sound and aerodynamically efficient.

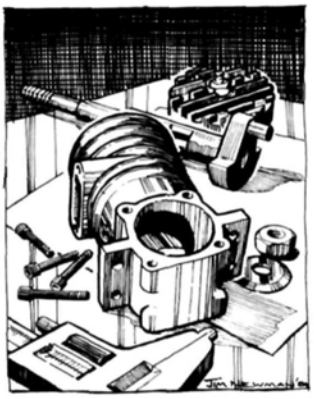
"Gas Lines," a monthly column, showcased the gas-model division of the National Aeronautic Association. The gas-model division was some 4,000 members strong in early '39, and, with the popularity of gas flying continuing to grow at a blistering pace, the division's membership continued to increase rapidly. This organization was created first to provide modelers with a forum in which to fly and compete against one another, and, second, to serve as a link between modelers and the growing, unwarranted restrictions placed upon them by state and local officials. Outside the modeling community, gas-powered planes were thought to be dangerous to property and public welfare. Modelers' continued support of this and other gas-model programs allowed organizations like the N.A.A. to overcome considerable nationwide opposition and to institute plans under which gas models could be flown in a supervised and regulated manner. The January '39 edition of "Gas Lines" featured some innovative gas-powered aircraft that ranged from futuristic looking streamliners to a pair of piggyback gassers. A tinkerer by the name of Bob

(Continued on page 112)

Comet Model Airplane & Supply Co. gave everyone a chance to win for just $4.95—the price of Carl Goldberg's Clipper.

Two Cubs get acquainted. Jesse Davidson, right, introduces the one in the fur coat to the one with wings.

Ken Werner and Bill Price with their original gas model piggy-back planes.



About Those Engi

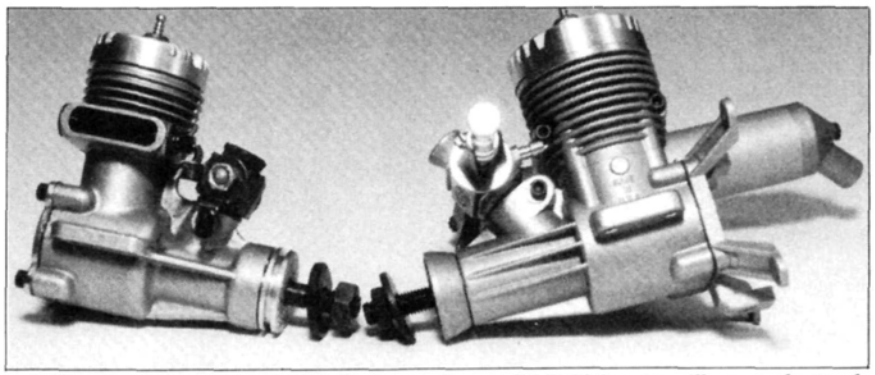
by JOE WAGNER

THIS YEAR IS MY FORTIETH anniversary as an aeronautical engineer. After all these years in the engineering profession, I've become rather accustomed to precision: precision not only in mechanical components, e.g., model motor parts, but also in data and qualitative information. Statements with indefinite meanings annoy me. For example: "Model engines are happier at high rpm." I've been around model airplane motors since 1937, but I've yet to see any of them smiling. I can only assume that what's really meant by the expression is that model engines are more reliable at higher rpm. This was certainly true of some older motors.

Today's R/C engines, however, run dependably throughout a very wide rpm range. Mostly, what makes the difference are the dimensions of the intake passage. Early motor designs that needed to turn fast for steady running had inlet openings that were too short or too large—or both. As a result, incoming airflow was unsteady at low speeds, and this caused poor fuel suction at the needle valve and, thus, erratic engine operation. Pressurized fuel supplies offered a partial solution; running at high rpm also helped a lot, since it reduced pulsation in the flow of the incoming air.

Because air has weight (slightly less than one ounce per cubic foot), when in motion, it develops inertia, as any moving mass does. Inertia increases in direct proportion to velocity increase, but inertia also depends on the total moving mass. If you double the mass of the incoming airflow, e.g. by making the venturi twice as long, you double its inertia. You can gain a major boost in inlet-airflow inertia much more easily this way than by trying to double the engine's speed. Inlet-airflow inertia is important to reliable model-engine operation, because when it's high, it tends to maintain a steady flow through the venturi and uniform suction at the needle-valve orifice.

On the other hand, the idea behind short, large-diameter venturis is to minimize restriction to the incoming airflow.



A '70s-vintage Lee-Veco .19 R/C Custom and a new K&B .20 Sportster illustrate the trend to longer venturis in today's R/C engines.

At first glance, this seems logical enough: The more air that can enter a model engine's crankcase while its intake port is open, the more fuel it ought to be capable of burning and, thus, greater power output should be possible. However, airflow through a restricted passage depends just as much on the pressure difference between its ends as on the size of the opening. Big orifices generally have small pressure differences, and vice versa. Thus, the theoretical benefits of large, short venturis on model engines have never been more than partially realized in practice.

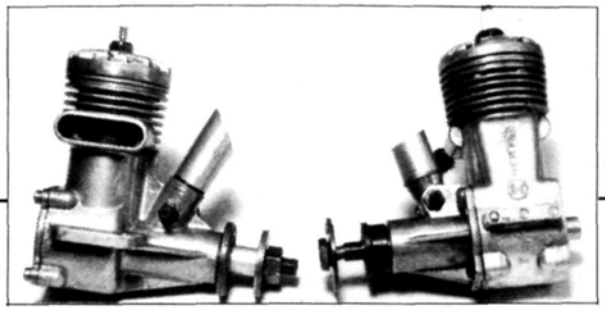
For flying free-flight and U-control models, I'm still using old-style, short-intake motors, but I've found that I can noticeably improve their dependability and ease of starting by inserting adapters to lengthen their venturis. Some of these are so long that the propeller barely clears them. They don't seem to cause any noticeable loss of engine power, but the improvement in fuel suction they provide is truly remarkable.

Because of the space necessary for their throttle barrels, R/C engines seldom suffer from intakes that are too short. Even so, the overall lengths of the inlet passages of today's R/C motors tend to be greater than on those in the past. For example, the K&B* .20 R/C Sportster's venturi is about 1½ inches long. This is 33 percent longer than that of the Lee Custom .19 R/C (also manufactured by K&B, but considerably older than the Sportster). And I'm sure most of us will agree that nearly all present-day model airplane motors are exceptionally reliable throughout their rpm range.

As I thought about the tendency to lengthen the venturi in modern R/C engines, I became curious about what would result from a *really* lengthy intake passage. To find out, I took an O.S.* MAX-S .30 that I knew to be an excellent runner, and I modified it with a 12-inch venturi extension. My idea wasn't just to find out whether the engine would run acceptably with such an extraordinarily long intake tube; I also wanted to see how it would work with the carburetor located at the far end—a whole foot away from the crankshaft port.

The accompanying picture shows the setup I employed. I made the extension from a 1-foot piece of plastic aquarium tubing and attached the carburetor at the extreme end. I then mounted it right in front of the fuel tank, which was unpressurized. For the running tests, I used 10-percent-nitro Red Max fuel with 25-percent castor oil content, and propellers ranging in size from 12-4 to 9-6.

This strange-looking lash-up worked very well indeed! With all prop sizes, the rpm loss was insignificant. I believe that the slightly increased flow restriction of the extended venturi was largely compensated for by the less turbulent air at the intake end. (The usual front rotary



These two early glow engines have been modified with intake extensions, and they now run far more reliably with unpressurized fuel tanks than they did in stock configuration.

arrangement puts the intake directly in the propeller blast. Located there, it can only draw in air the density of which is effectively reduced because of the slipstream velocity.)

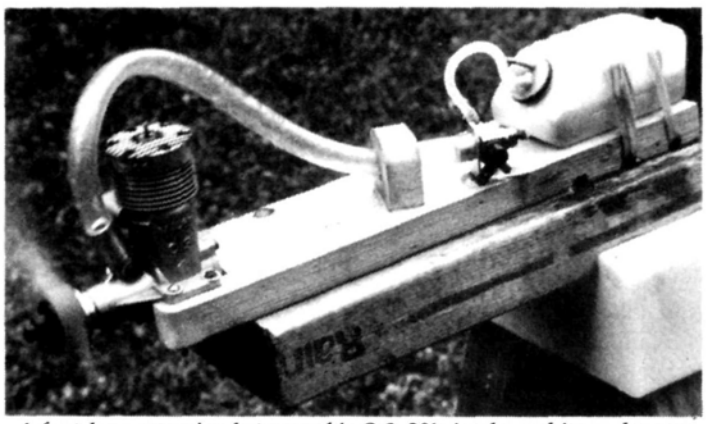
There are two distinct advantages of this unusual engine/venturi configuration, and both are due to the carburetor's position next to the fuel tank: There is practically no change in engine speed, whether the motor is pointing upwards, downwards, or anywhere in between, and needle adjustment is absolutely safe. However, I did have one problem with this oddball setup. I couldn't hand-start the engine with the usual choking technique. This may have been because of the steep "uphill" portion of the vinyl tubing. I could see droplets of fuel and oil accumulating here, while I unsuccessfully tried every trick I knew to get the engine going without priming the cylinder. However, when I did resort to exhaust-port priming, the engine hand-started readily and the droplets within the plastic tubing vanished.

If I were to use an arrangement like this for powering an R/C model, I'd make a few changes: I'd form the intake extension out of thin-wall aluminum tubing, rather than use vinyl again, and I'd keep it as parallel to the thrustline as I could manage, without employing sharp bends in the line. Also, I'd route the extension so as to interfere as little as possible with the flow of cooling air to the engine's cylinder.

An arrangement of this sort should be especially effective for small R/C engines, e.g., .15s and under. With this, I can envision a return to the once-common "rear rotary" configuration, because this would provide a simple straight run for the intake extension tube. Also, during the heyday of U-control speed flying, rear rotary engines were almost invariably the trophy winners, beating front rotary motors with ease.

The rear rotary setup provides minimal crankcase volume (which is also an advantage of reed-valve motors), while enabling straight-through, unimpeded inlet port flow, (which the reed-valve design can't begin to match).

If, in the future, some enterprising model engine manufacturer markets a rear-rotary, long-intake R/C motor with its carburetor located back in its airplane's fuselage alongside the fuel tank, remember you first saw the concept here in good old *MAN!*



A foot-long extension between this O.S. 30's intake and its carburetor makes for an off-the-beaten-track installation—and one that works quite well.

In case you're wondering why I used propellers as big as 12-inchers on the O.S. 30 in my extended-venturi tests, it was because that's the size props I use to fly .29-powered R/C models. Sure, large-diameter props cut the engine speed way down, but it's *thrust* that pulls the airplane through the air, not rpm. Want some numbers? My O.S. MAX-S .30 (in standard configuration) turns a 9-6 Graupner* propeller at 12,500rpm (throttle wide open) and puts out 60 ounces of static thrust. Changing to a 10-5 drops the maximum rpm to just under 12,000, but the thrust increases to almost 70 ounces.

Going up the scale, I only get 10,500rpm with an 11-5 prop (Top Flite* maple), which still produces a thrust increase to 73 ounces. A Top Flite 12-4, although it runs at a mere 9000rpm on the O.S. 30, puts out 75 ounces of static pull! Admittedly, these figures weren't obtained with precision instruments. However, they do show the relationship: On a model engine, increasing the propeller diameter decreases rpm and increases thrust simultaneously.

I fly my R/C airplanes with smaller engines and larger props than most modelers use. I put a .20 or a .25 in a model like a Sig* Kadet, where everybody else uses a .40 or a .45, and I spin 10- or 11-inch props on the .20 to .25 motors, while the guys with .40s in the same-size airplanes use 9-6s.

I don't do this just to be different; I firmly believe that most modelers use engines that are too big for their R/C models, but they don't realize it, because they're wasting much of their engine's output by spinning props that are too small. Their models make a lot more noise than mine, too.

**Here are the addresses of the companies mentioned in the article:*

K&B Manufacturing, 12152 Woodruff Ave., Downey, CA 90241.

O.S.; distributed by Great Planes Model Distributors, 1608 Interstate Dr., P.O. Box 4021, Champaign IL 61820.

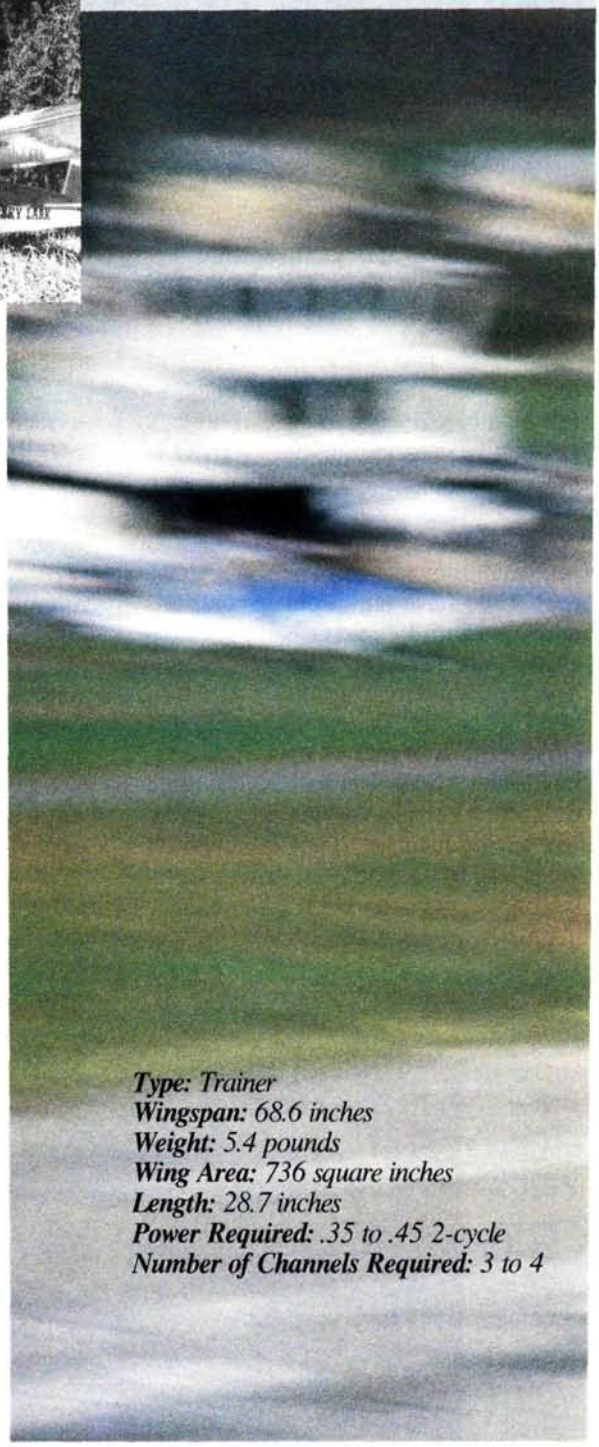
Graupner; distributed by Hobby Lobby International, 5614 Franklin Cr., P.O. Box 285, Brentwood, TN 37027.

Top Flite Models, 2635 Wabash Ave., Chicago, IL 60616.

Sig Manufacturing, 401 S. Front St., Montezuma, IA 50171. ■

THUNDER TIGER'S

SKY LARK 40 T



Type: *Trainer*
Wingspan: *68.6 inches*
Weight: *5.4 pounds*
Wing Area: *736 square inches*
Length: *28.7 inches*
Power Required: *.35 to .45 2-cycle*
Number of Channels Required: *3 to 4*

Our intrepid aviator is gradually working his way back up to full scale with his second R/C airplane.

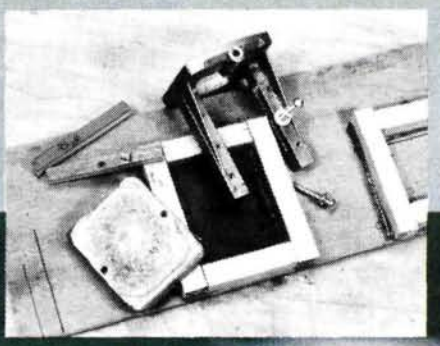
by BUDD DAVISSON

SOMEWHERE IN TAIWAN, Chile, East Jabib, or some other country where labor unions haven't been discovered, is a shop staffed with hyperactive hobbits. They're chained to workbenches, and for one rice taco/blintz a day, they build model airplanes. But these aren't just *any* hobbits; these are hobbits who really know what they're doing. They know so much about shrinking, gluing, trimming and cutting that they knock out an airplane every few minutes.

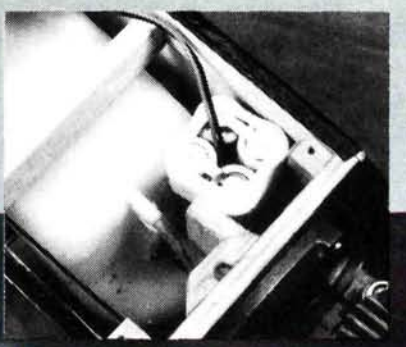
On popping the top off the Sky Lark 40 box, I immediately knew that Thunder Tiger*, the manufacturer of this kit, had the right hobbits at the right price. Even the way the box is packed is top-notch, with each component sealed in its own plastic sleeve.

ASSEMBLY: As it comes from Thunder Tiger's hobbit hobby hut, the Sky Lark consists only of major components, completely covered and ready to be stuck together. The wings are completely finished, with ailerons and hinges already installed; just a shot of CA on each one finishes the job. The covering job was so beautiful that it stopped me from yielding to the temptation to cut open a wing panel to see the quality of workmanship inside. But I knew I'd be dismantling the wing in a rather forcible manner, sooner or later, so why rush it? The wings are balsa units with a deep, planked, leading-edge torque box that extends back to almost 30-percent MAC (Mean Aerodynamic Chord). It's smooth and clean, and not one pin mark or other flaw showed through the preprinted covering.

The wings are joined by a single laminated ply strip that's inserted into spar boxes in either wing root. The strip, or carry-through, fits just tightly enough in the spar boxes to have no slop, but it allows enough room for some epoxy. The instructions show two spar carry-throughs, but the wing in our kit was only set up for one. The rear spar loads are supposed to be carried by the two root ribs, which are glued together face-to-face. In our kit, however, the ribs wouldn't quite match, because the edges of the spar boxes protruded



A 10¾-ounce slab of lead was cast in a mold and held to the bottom of the motor mount with left and right retaining plates. Sky Lark is a good candidate for heavier 4-stroke.



Receiver battery (before being wrapped in foam) had to be placed as far forward as possible for balancing. More nose weight was still needed.

Photos by Budd Davisson.

about ten thou. A couple of quick passes with a sanding block and some 120 squared off the rib faces and, when glue was applied and the wings pushed together, the match was perfect.

The tail surfaces are built up, pre-hinged (need the CA) and ready to install. It took maybe 10 minutes to accurately trim the covering away from glue areas and to epoxy the tail into place.

The landing gear is a cross-over affair using two identical bent-wire legs with 90-degree stubs fitting up into maple blocks in the fuselage. I had to slightly trim the edge of the holes meant to accept the stubs, since no allowance had been made for the bend radius of the legs. When enough clearance had been cut, I was able to push in the legs with exactly the right amount of effort, i.e., I didn't break anything pushing them in, but it had me worried! They're retained with the flat metal strips and screws

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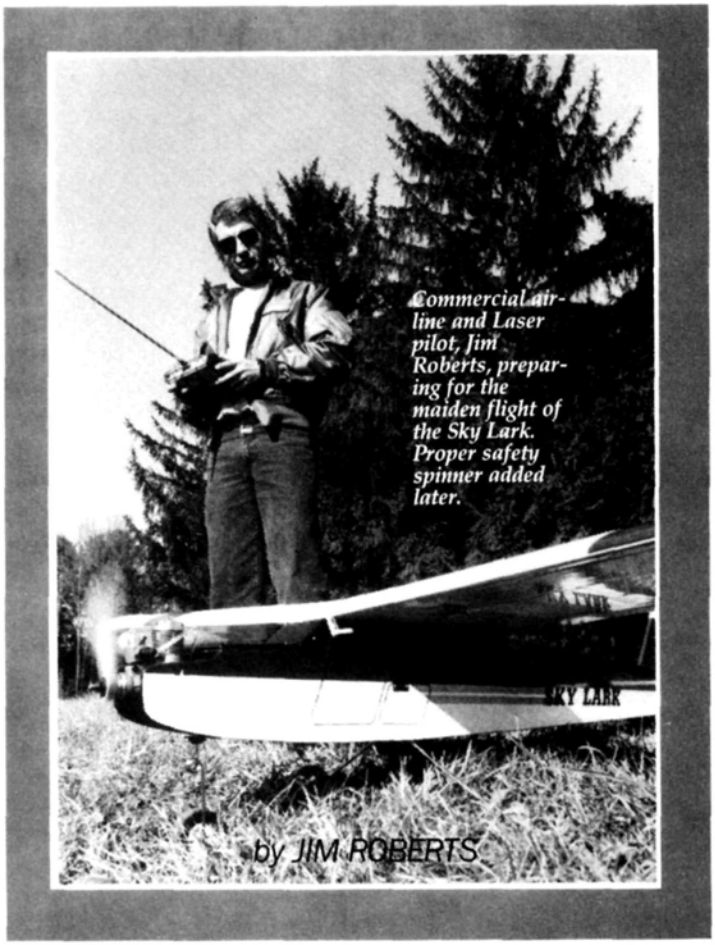
FLYING THE SKYLARK



Commercial airline and Laser pilot, Jim Roberts, preparing for the maiden flight of the Sky Lark. Proper safety spinner added later.

WHEN ASKED to evaluate the Sky Lark, I wasn't certain of the best way to approach it, but Budd said I should treat it as if it were a pilot report on a full-size airplane, so that's what I did.

In the first place, I was impressed by the quality of fit and the finish on the model; it really looks good. It's unfortunate that weight was needed in the nose, although, as we found later, the all-up weight of the model helps it penetrate gusty conditions.

We know it penetrates gusts well, because we had lots of them on the day we flew. In fact, the wind picked the airplane up at least once while it was taxiing, so it was with some apprehension that I agreed to fly it. In fact, it handled the turbulence and gusts as well as any R/C ship I've flown. It was so windy that I wouldn't have flown my own birds, but the Sky Lark didn't seem to care.

As soon as I had the airplane off the ground, I realized that it had been a long time since I'd flown a trainer—or was this an exceptional airplane? Considering the wind, the Sky Lark showed tremendous stability. In fact, I laid it over in some pretty healthy banks, and it just dropped the nose a little and leveled out on its own. It did the same thing in pitch, and it just seemed to take care of itself in the gusts.

The controls (at least as set up with the throws recommended) lack authority in almost all axes. Of course, this is great for a trainer, but in the wind we had, the rudder was only adequate. Also, the narrow chord elevator tends to disappear as soon as the power is shut off. Again, more throw might help, but at the first elevator horn hole, during approach, elevator input needed was really high. However, it would be difficult for a beginner to over-control on landing, as is often the case.

Although not designed as an aerobatic airplane, I couldn't resist, so I did a few loops and found that the Magnum Pro .40 has plenty of power for the airplane. This was obvious by the way it accelerated on takeoff. In doing loops, it easily grooved over the top. I started to roll it, but gusts kicked it back to level on both attempts, so I gave up. It will need more aileron or calmer air to do good rolls.

On the ground, the airplane is an absolute pussycat. The nose-wheel steering is dead on the money and gives a reasonable turn radius while still being willing to track straight ahead, if left alone. This is as easy as R/C airplanes generally get, and Thunder Tiger has done a good job of engineering-in a lot of limitations that will keep the beginner out of trouble. For that reason alone, the Sky Lark is a good machine and well worth the 100 bucks it cost. ■

SKY LARK (Continued from page 75)

supplied in the kit. All the hardware provided was nicely finished and plated, and, amazingly, it was *all there! All* of it!

The motor mount and nose-wheel bracket are already bolted into place, and they line up as though they were align-bored on assembly. Both mounts were on-center and square. (No flies on these guys!)

The poplar (I think) ply box fuselage has two major ply bulkheads at the wing-attach points, with a number of other doublers and intercoastals here and there. One of these accepts a precut ply servo tray that literally snaps into place. Everything in the kit had a snap fit, but you should closely inspect the interior fuselage joints. I found one that was a little dry, and another with enough gaposis to possibly compromise the joint. Neither case was critical, but both were well worth looking at closely.

The only area I didn't like was the gas-tank mounting—or lack of it! There was only one saddle in place for the tank, and it was too far back. I stuck in another one and then blocked the tank into position with ¼-inch scrap. The supplied instructions are obviously used for a number of similar models, so certain details are omitted, including those for tank mounting. It's not a problem, but it should at least be illustrated, if not explained.

The radio installation is also shown with generic drawings. In fact, there are two drawings: one labeled, "Typical radio installation for high- or shoulder-wing model," and another one for low-wingers. They do the job, but they assume the builder has attempted some R/C work before, and they omit a ton of details. For example, the builder has to figure out how to route the throttle and nose-wheel steering rods around the fuel tank. Again, no big deal, but it makes us beginners do a little extra head-scratching.

When installing the balsa-rod push-rods for elevator and rudder, the square ends of the balsa rods bothered me, because they were in very close proximity to one of the bulkheads and could possibly jam up. To avoid this, I cut the shrink tubing and removed the wire ends so that I could taper the ends of the rods. I then put them back together with glass-cloth and epoxy.

Installing the Aristo-Craft* radios was a no-sweat procedure, except for the aileron servo. Sinking it far enough into the wing to get a decent mount height meant cutting a good chunk out of the middle of the two root ribs just behind the main spar. Since the rear spar depends on having the root ribs of each panel securely glued to each other, cutting a piece that big out of the root ribs worried me. I cured that by epoxying a glass patch completely around the cutout, with a double strip of glass on the aft edge of the hole. The glass, combined with the servo-tray mounts, should carry the loads smoothly and evenly from panel to panel.

I've just taken longer to *describe* building the airplane than I actually took to build it! Everything clicked together so nicely, I almost forgot to check the CG after mounting the Magnum Pro .40. It's a good thing I remembered! Setting up an accurate CG location (3 inches aft of the leading edge), I taped some ply pivot pads into place and put the airplane on the balance poles. The CG was 1 inch behind its specified location, and that's a lot!

With the tank located according to the instructions, there was barely enough room to get the batteries up against the fire wall, and there wasn't enough room to pad them. After flying the airplane, I relocated the tank by moving it up until it was even with the top of the fuselage for better fuel draw, and this opened a good-size space underneath it. That's where the padded batteries wound up.

But even with the batteries moved forward, the CG was still way too far back, so, as repugnant as it was to me, adding lead was the only logical answer. Piling wheel weights onto the engine, I found that it took an amazing 10¾ ounces of the useless, heavy stuff to level the airplane out. I'm wondering if the airplane wasn't originally designed for a four-stroke?

PERFORMANCE: The first trip out to the aerodrome was greeted with lots of sun and gusty winds. We worked off the overrun area of a runway and even the 1/1 Cherokees and C-150s were having their problems with the wind. Since this was my first attempt at flying a "conventional" R/C ship (after my adventures with the ½A styrofoam EZ-Bee), it was obvious that the day was well out of my ability envelope. So, for the Sky Lark's first flight, I turned the control box over to Jim Roberts of Hopatcong, NJ. For his input, see the sidebar.

As an introduction (since I know Jim

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duke's mixture

New color catalogs due from printers about now. Besides our product descriptions, it has full size outline drawings on our motors and several articles of interest. They are free, but you will get one quicker if you send us a self addressed envelope with .45¢ worth of stamps.

40th anniversary Fox 35 is now available. The 40th anniversary bit being the attractive engraving on the by-pass. It is finished in natural aluminum finish like 40 years ago. Take a nostalgia trip — build an old timer stunt model with a new 40th anniversary Fox 35.

Take-off hesitation can be eliminated and acceleration out of a turn can be improved by simply re-routing your fuel line. No Bull — it really works. This applies to standard tank without pump set-ups. What you do is route your motor's fuel line around the right side of the motor, over the front bearing housing in front of the carburetor, and back, then loop it up to the fuel nipple. The reason that it works is that during acceleration the fuel wants to move back, creating a pressure reduction or total cavitation at the jet in the usual set-ups. By routing the fuel line around the front of the carburetor, the fuel to the left of the foremost point is pushed toward the carburetor, not toward the tank. It is the small amount of fuel in this section of fuel line that keeps feeding the motor for the two or three seconds of severe acceleration.

Now — about my comments on this business needing younger blood. What I am looking for is two talented, highly motivated people to come to work with us. One to be a business administrator type with emphasis on merchandising. The second person to be an engineering and manufacturing type. Both must know model airplanes. The intent would be for them to eventually own and run the business.

I am looking for an initial investment from each in the order of $250,000.00. For this each would get about 10% of the stock plus a modest salary plus a fixed price, five year option for up to a total of 49% of the total stock each. I would retain 2% to be a tie breaker in case it was necessary.

Happy Flying,

Duke Fox

Manufacturing Company
5305 Towson Avenue
Fort Smith, AR 72901
Phone (501) 646-1656

SCALE MASTERS

(Continued from page 57)

Dog powered by an O.S. .91. It was a good-looking airplane, but, for some reason, didn't score as well as Jerry had hoped. Again, without seeing documentation for everything, I really can't comment on why some planes scored the way they did.

Further down, we saw Austin Cleis and his Piper Tomahawk. Powered by an O.S. 108, this ship performs well but lacks that little extra something to nudge it into the winners' circle. (Austin says that a military model is next.) Jerry Sprinkle came from Texas with his new, 18-pound Dave Platt P-51 that looked really good, but first-round damage kept him out of the rest of the action. A really nice T-28, completely scratch-built by Mel Whitley, didn't fare too well in static, but its performance was just great. Mel had an average flight score of 89.25, but couldn't break into the top 20. With some improvements in that static score, he could become a real contender in the future.

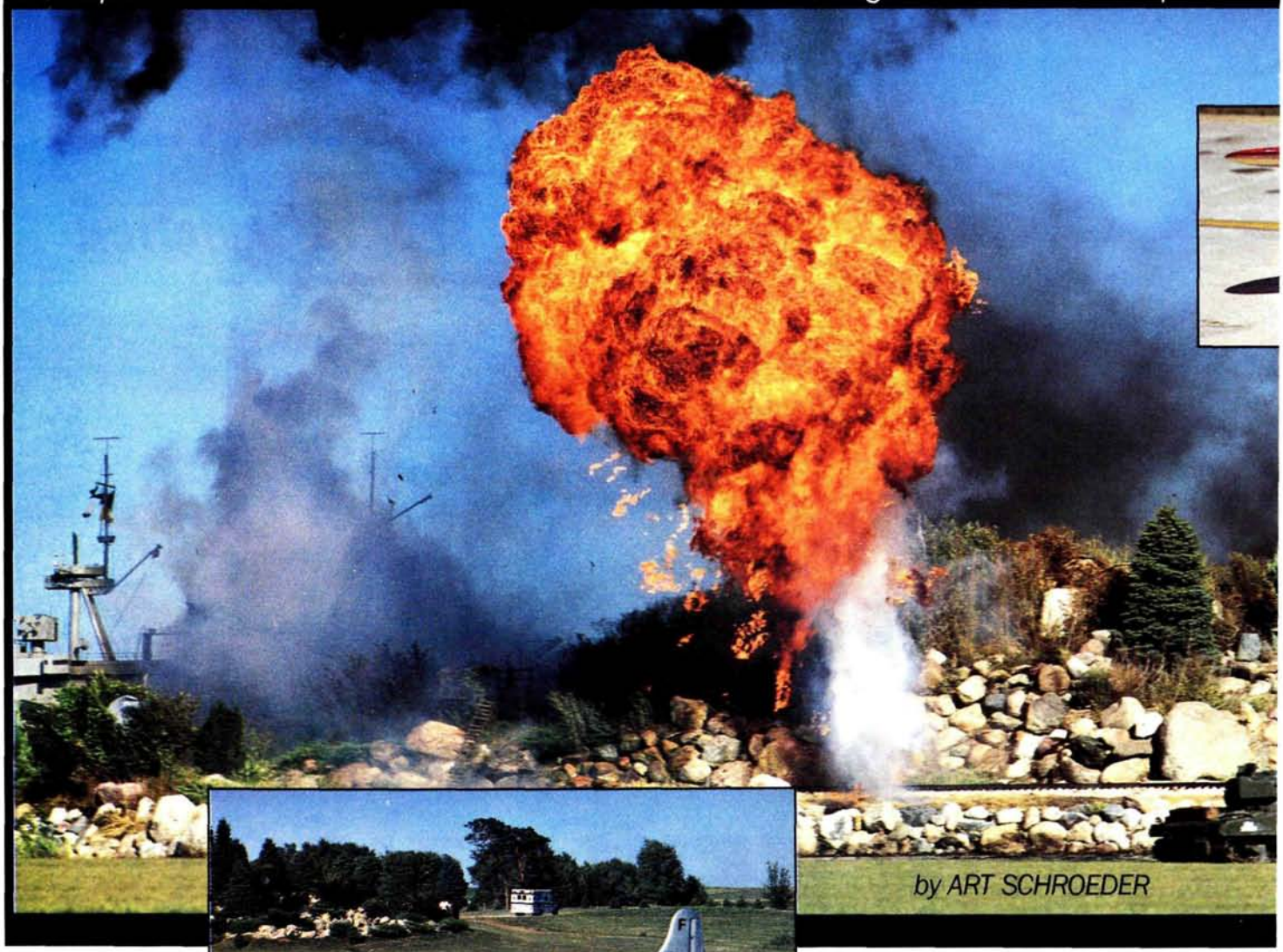
It was good to see Skip Mast and the famous C-130 at this year's contest. Skip has always done well, and you have to see this model to believe it. It spans 97 inches, weighs only 14.5 pounds and flies too fast on four K&B* 3.5 2-strokes!

One of the most unusual subjects I saw was the Midwing special entered by Neil Snodgrass. This is a replica of an airplane that's hangared somewhere in Neil's hometown. It features parts of many Piper aircraft and, for a different appearance, the builder thoughtfully put the wing in the middle. (It *does* look kinda nice.) Speaking of nice, Jeff Micko had one of the most accurate P-47s we've seen in a while, but it didn't score well. Built from Mike Beaulieu's plans, Jeff's bird weighs 22 pounds and is powered by a Super Tigre 3000.

Another contender was the magnificent Waco cabin bipe scratched by Charlie Nelson of Berlin, MA. Charlie has one of the quietest O.S. .90 4-strokers we've heard, and it flies the 75-inch, 15-pound bipe with power to spare. Dave Voglund entered a nice P-40 built from Bob Holman plans, but this was one ship that needed to be a little larger. If Dave were to blow that sucker up to about 84 inches, I think he'd have something there. (Tom Czikk showed us that!) We took a good look at Jeff Foley's ME-109, because, after the weekend's competition, Jeff would either retire it or sell it! This veteran was built from a Dave Platt kit, has logged over 300 flights and placed

(Continued on page 88)

Perhaps the "Oshkosh" of model aviation. It was entertaining, educational and spectacu



by ART SCHROEDER

Above: *The pyrotechnics employed in the "Striking Back" display must be seen to be believed.*
Right: *The incredible Byron B-29; dual radios, four Quadras. Flown each day of the Expo.*

BYRON ORIGINALS

AVIATION EXPO

1 9 8 8

MANY ANNUAL EVENTS are on every modeler's calendar as must-see events: AMA's Nats, EAA's Oshkosh spectacular, R/C world championships of any kind, the Las Vegas Tournament of Champions, Orlando's Tangerine International, the Scale Masters, Sig's annual contest—the list is nearly endless. All these events lift our modeling spirits, motivate us to do more and provide a marvelous "texture" to our hobby/sport. And one event is a *real* must: Byron Originals'* Aviation Expo. To say the Aviation Expo is *more* than worth the visit is to understate the case.

The Byron Aviation Expo started in 1982 as an International Miniature Aircraft Association (IMAA) annual fun fly. Over the years, it has grown into so much more than that first year's effort. To be sure, along with ducted-fan jet aircraft, the giant-scale models of 1982 are still a mainstay of this Iowa-based meeting—models *do* reign supreme in Ida Grove! But there's also an incredible air show that adds luster both to R/C and to full-scale aviation. Where else can one see the best of giant scale, the hottest ducted fans, the Eagles Aerobatic Flight Team, and a re-enactment of World War II's Pacific battles with 1/5-scale models (flying and floating)? Where else can one see an R/C model show team that makes models do things that most modelers only dream about: skydivers; a 1/5-scale B-29 that dwarfs some full-scale aircraft (including the BD-5J Coors Silver Bullet, another Expo act); a sizeable R/C manufacturers' trade show; a series of R/C seminars; and a flying site that surpasses *any model field* in this world? Byron's Aviation Expo educates, entertains, involves and motivates its participants and spectators.

Left: *Very pretty (and colorful!) Monocoupe 90 built by Paul Grubich.*
Right: *Bud Atkinson and his Byron F6F-3 Hellcat. Sachs 3.7 engine; 26 pounds.*

1988's Expo started on a Wednesday in August. Byron Originals' staff controlled all aspects of the show, and all the events were precisely scheduled. Giants flew at their set hour, jets roared off at their appointed time, skydivers jumped at 4 p.m. and "Striking Back" exploded at 5 p.m.—the times varied only by minutes. Only the weather couldn't be controlled, and that proved to be hot (105 degrees), wet and windy much of the time, but the wind saved many of us from heat prostration.

There seemed to be fewer innovative models—giant or jet—this year; many of those flown had been seen in past years. This isn't to say there were no special presentations of the modeler's art—indeed, there were many. One plane that stood out was a super P-38 Lockheed Lightning in at least 1/5 scale. Unfortunately, I wasn't able to track down details of this magnificent bird, but it was powered by two Sachs 3.4 engines and it created a mild sensation when it was flown. Some fliers said this "forked devil," finished in Confederate Air Force colors, was the work of Mike Kestner of Florida. On its only flight, some trouble developed, but it landed without incident and was thereafter displayed in the Byron circle. It was a magnificent project and one not seen at the usual flying affairs. Don Neill returned to Ida Grove with his latest version of the Gee Bee (the "milk-bottle" design). Long-time readers will remember that Don's Gee Bee was a sensation a few years ago and, later on, in a documented collision with a bird, it was destroyed. The new Gee Bee was powered by a Sachs 3.7, weighed 32 pounds and was as good as its predecessor. As flown by Terry Majewski, this was one to be watched; it "stopped the show!"

Last year, there seemed to be a frantic effort to prove which sport jet was the fastest, but no clear winner emerged. This year, everyone seemed to feel that they were *all* fast and *all* fantastic performers. I watched Byron's Bullet, Violett's* Viper and Jet Model Products'* Starfire; they all tore up the sky and proved that ducted fans have performance plus!

Tom Cook's Starfire caught my eye (or, more accurately, *ear*); not with its flight performance (even though that was great), but rather with its sound system that substantially reduces noise. The sleek DF was super in the air, and its noise level amazed observers! Frankly, my only objection to fan operation (and I've built quite a few) is the noise; these models howl like nothing before in modeling. Anything that quiets DF flying is most welcome. Tom Cook had another trick to show: an in-flight adjustable needle valve. This valuable accessory can be mounted anywhere in an airframe; it's limited only by the length of necessary fuel lines.

Most ducted fans at Ida Grove were from well-known kits. The Florida-based Cloud Dancers' show team put on a formation display with Byron F-15 Eagles. They surely get top-level performance from that jet, and their exciting show is very well-planned. The same team presented R/C skydivers, an incredible free-style exhibition with a .40-powered fun-fly machine, and no less than Superman in flight. All great fun!

One jet not from the usual mold was the F-80 Shooting Star by Bob Hill of Capistrano Beach, CA. The

Left: *Don Muddiman and Don Lowe with Ultimate bipe by Bob Godfrey.*
Above: *Walt Moucha with his 1/4-scale Marquardt Charger, which duplicates 1982 Oshkosh Home-built Grand Champion. Seventy-four-inch span; 16¼ pounds with Quadra power. (Future kit.)*

BYRON ORIGINALS

AVIATION EXPO

Quarter-scale SM 260 by David Goerne of Streator, IL. 87-inch span, 25 pounds, 3.4 Stihl-powered. (Future MAN *construction article.)*

airframe was modified from a Sterner kit (that I understand will soon be available from Nick Ziroli), it had a Byron fan turned by a Rossi 81, and it was finished with MonoKote*/Hobbypoxy.

Ducted fans didn't dominate; indeed, giant scale ran about three-to-one (and the available flying time reflected that fact). DF flying surely made its mark, but giant scale garnered the most interest. One of the most spectacular flying giants at Ida Grove was a "wolf in sheep's clothing"—a Clipped Taylorcraft* by Jim Hiller. Rarely was the airplane more than 10 feet or so above the runway in knife-edge, inverted, or rolling passes. The airplane's benign appearance belied its spectacular performance, but spectacular it was, on O.S.* 108 power and a 90-inch wing carrying 11 pounds.

Byron Godberson (left) discusses "Cloud Dancers'" performance with one of the pilots.

However, if I had to pick the most sensational airplane at Expo '88, it would *have* to be the Ultimate Bipe as flown by none other than Don Lowe, our AMA president. This bird, though short on aesthetics, was certainly long on performance. Indeed, this angular-looking bipe outperforms any two-winger I've ever seen—bar none! Lowe's Ultimate is one of those prepared by Bob Godfrey for competition at the Las Vegas Tournament of Champions. I gather that a number of the bipes will be there, and I see the design as a clear winner; it's *that* good in the *right* hands.

While the Ultimate was my choice for top performer, the best-looking bird at this Aviation Expo was a Byron F-15 by Hicks Milner. This twin-powered (O.S. 77s) jet had a finish that can only be described as flawless. Basic finishing material was Sikiens Automotive acrylic with a clear topcoat.

There's something about biplanes that charges up most modelers; it must be their appearance, since most modelers I know *hate* building two wings! Well, there's a new bipe you'll love to build: Walt Moucha Models'* ¼-scale Marquardt Charger, a scale version of 1982's Oshkosh Grand Champion. The airplane's 74-inch wingspan carried 16¼ pounds on a 2ci Quadra, and overall, it has 1756 square inches. The Charger is completely built up and, considering its designer's past successes, it should be very popular. Kits will be available in November from Walt Moucha.

Another super kit flier was found in Byron Originals' newest offering—Christen Industries' Husky A-1. Essentially, this is a Super Cub brought into the '80s. The airplane includes a symmetrical airfoil and a single-slot flap. As flown by Dean Copeland, I saw an airplane that looked like a "ball" to fly. Its takeoffs were incredibly short, its landings almost unbelievable; maneuvers appeared to be limited only by any pilot's skill. The Husky appears to be a real winner, and it will soon be improved by a set of scale EDO floats. Byron's Husky looks like an airplane for everyone!

David Goerne of Streator, IL, arrived with a 260 SIAI Marchetti inspired by, and finished in, the colors once shown on a *MAN* cover. The ¼-scale airplane looked great, was powered with a 3.4 Stihl, had an 87-inch wing and weighed 25 pounds. *(Editor's note: David's airplane will be featured as a construction article in a future issue of* MAN.*)*

Bud Atkinson (one of my favorite designers) didn't disappoint us. Bud usually flies his own designs and, at first, I thought his magnificent Hellcat was his latest design. Not so; Bud had a

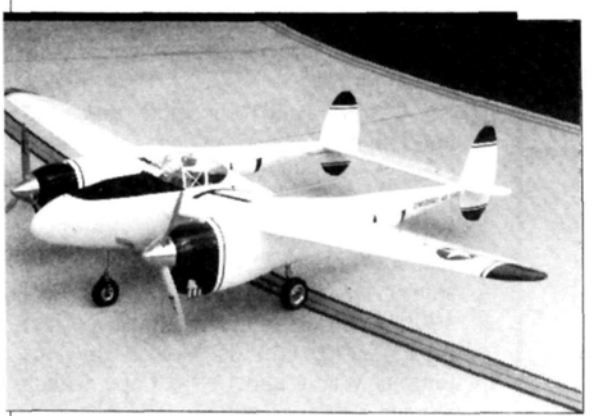
Right: *Full-scale Douglas C-47 took part in mock "D-Day" invasion.*

Modified from Sterner kit, pretty F-80 Shooting Star by Bob Hill, of Capistrano, CA.

Pretty Piper Tri-Pacer from the Cambria kit built by Steve Pully. O.S. Pegasus-powered; Black Baron paint over Coverite; 20 pounds.

26-pound Hellcat with a Sachs 3.7 and lots of super Atkinson touches. It turned out to be a Byron kit—proof positive of what can be done with Byron's offerings. It was a real beauty!

The Show hasn't changed all that much: Skydivers were brought to earth by circling Eagles and the Cloud Dancers did their thing. Unfortunately, Don Muddiman's "death dive," or what the Cloud Dancers call the "energy-efficient landing," ended with a blast on earth. Basically, Don takes his airplane to an altitude where it's just a speck. This is followed by engine cut-off and a vertical dive to an altitude of only a few feet, followed by a sharp pull-out, loops, rolls and a dead-stick landing at the pilot's feet. Unfortunately, this time, Don missed with a splatter we all know so well. But it was all in fun, and Don continued his act at the Expo with another airplane. By the way, that was one splat out of a dozen times I've seen Don do this; if I were the pilot, it would be a perfect 12 splats for 12!



P-38 done in CAF markings; think it's the work of Mike Kestner. Twin Sachs 3.4.

I spent a few hours at Byron's new fuel plant—impressive. Here was fuel untouched by human hands; indeed, this was fuel untouched by *any* contaminants that could cause a problem. I've seen a variety of fuel-manufacturing processes in my time, but I've never seen one as professional and "state-of-the-art" as that at Byron. The new line of fuels fits all modeling applications with a variety of blends. I'm sure they contain everything claimed, and I'm equally sure they *won't* contain water or other things that can cause a poor run.

Back to the show: A new act was introduced—Jim Dorsey's "wing-walking" on a gorgeous Stearman. This was a flying-show act with a real difference—no straps, lifeline or parachute. Being a devout coward, it wasn't a performance I'd ever want to join. Jim Dorsey obviously *isn't* afraid, and the crowd cheered.

The cheers continued for "Striking Back." No surprises this year, but the show has been honed to a new level of excellence. The passes of 1/5-

(Continued on page 122)

SCALE MASTERS

(Continued from page 82)

4th at this year's Nats and 6th at the '86 Masters.

My airplane is a Kawasaki KI-61 Tony. It's completely scratch-built to a scale of 1/5.5, which gives a wingspan of 86 inches. Power comes from an O.S. 108 turning a Zinger 14x8 wood prop. I use nothing but Red Max custom-blended fuel (in this case, 5 percent nitro and 15 percent castor oil), and I never use synthetic oils. The plane weighs just under 15.5 pounds and flies extremely well. I have no plans to kit it or to sell plans and parts (don't have the time). Enough of that; let's get on with the contest coverage.

Although initially overcast, Saturday's weather improved steadily to the degree that a sunscreen was needed. Since everyone had sorted out their major problems, we expected to see some better flight scores for the third and fourth rounds, and generally, that's how it went. Some of the really good-looking aircraft fell out of contention with poor static scores or miserable flight scores. It happens every year, but it's always lousy when it happens to *you*. Fresh from a Nats win, Wayne Siewert was competing with his Mooney, but he just couldn't get those 90+ scores at the flight line. Greg Namey's new 1/5-scale FW-190D9 looked absolutely terrific from 25 feet away, but evidently displeased the static judges at the closer distance required, and mechanical difficulties kept the bird from making a complete flight. Larry Harville half-wrecked his Johnson-designed P-38 before he ever took off. First, he threw one of his spinners, then he dropped a lower cowl, and this was followed by one of his drop tanks and sundry bits and pieces of plywood and balsa. Determined to fly, he proceeded to plant the thing into the dirt at about 95mph, while attempting a high-G pull-out to force down one of his main gears. When asked why he didn't pull up a little sooner, Larry just said, "I plumb forgot!"

Others who had respectable statics and good flights, but just couldn't get that little extra, were: John Guenther and his Platt FW-190: Jerry Fingler's Bird Dog: Bob Wischer's Mailplane (94 static): Don Hatch's immaculate AG Truck (94.5 static); Dr. Bill McCallie's pretty FW-190D9: Frank Pring's almost perfect Ziroli AT-6; Charlie Nelson and his famous Waco; and David Pape with a Kinner Sportster powered by his own, homemade 5-cylinder radial!

While these had their share of diffi-

culties, one stood out and could do no wrong. Bob Fiorenze, with his new Northrup F-18, set the field ablaze with some of the finest hot-dog flying we've seen. Coupled with a 95 static, the average 94 flight score was something only *one* man had a chance to beat, and he failed to do so. Bobby went on to win the Masters, and 2nd was Bob Frey. Both Bobs have always done well at the Masters, but this is the first time Mr. Fiorenze has grabbed a 1st, and I think it's also the first time that Bob Frey has grabbed 2nd.

It took the fifth round on Sunday to give us our final standings. Only a few people changed position from where they stood on Saturday. I was one of the very few who argued that a fifth round was grossly unfair because it didn't allow all contestants to fly in front of the same judges. The only way it could possibly have been fair was by having all contestants fly in front of all the judges for a fifth round, or to fly two more rounds with half the judges on each of two flight lines. The top 12 really felt the brunt of this decision; a couple of guys dropped from above 7th to below 10th, and a couple moved up a few notches. Gene Barton and I were two of the lucky ones: Gene put in a 95 flight in the fifth round, and this not only pleased Gene and his watchful dad, but also upset a few others at the same time! I was able to put in a great flight with the Tony to wind up with a 91.625 flight average—good enough for 4th place. In the process, Shailesh Patel (last year's 5th placer) was bumped to 8th, Diego Lopez dropped to 6th, and Bill Miller moved up to 5th.

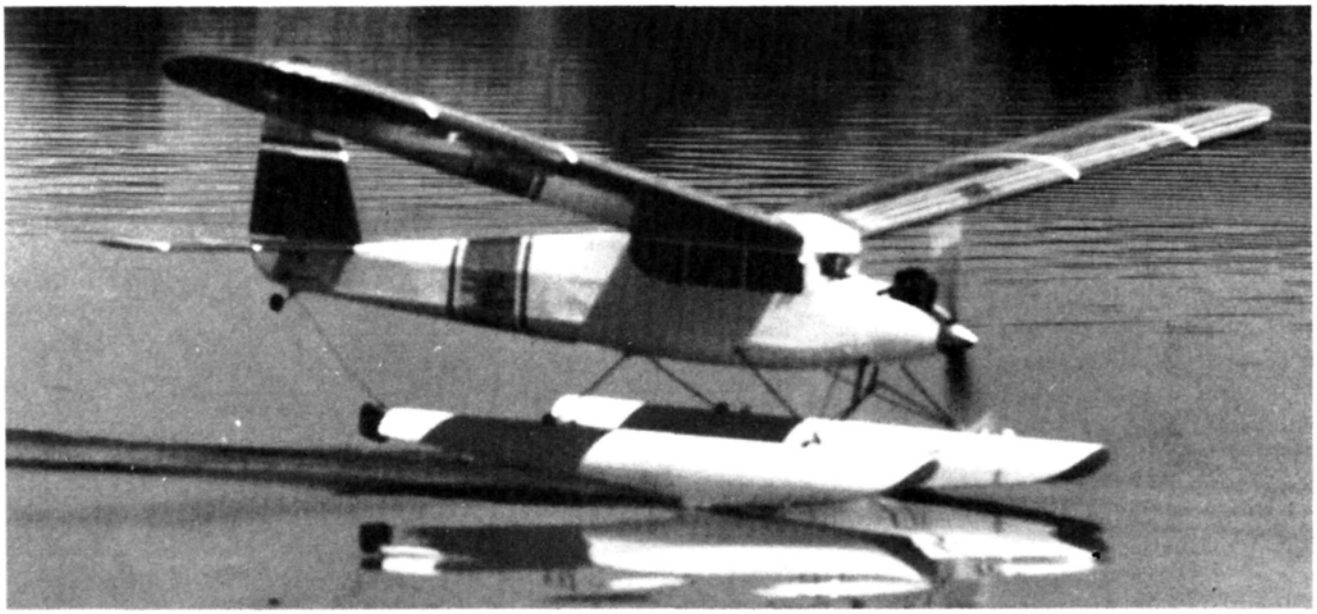
For reasons we'll never know, we had a few crashes at this year's meeting; it wasn't as bad as Phoenix, but it wasn't good. Kent Walters lost his SBD; Pappy Parsons dorked the Twin; Larry Harville took his P-38 home in a plastic bag; John Guenther balled up his FW-190, Denny DeWeese blew his Focke Wulfe up while flying combat *after* the meet; Don Hatch wrinkled the AG Truck; David Pape blew his engine and Greg Namey gave his FW-190D9 a couple of nose jobs.

The beat-up at the contest's closing is always good for a few thrills and chills, and this year was no exception. I think we had Al Casey and his MIG-3, Gene Barton and the P-51, Diego Lopez and the Hellcat, Shailesh Patel with his Baker P-47 and Bob Frey and his Thunderbolt, all chasing their adversary—yours truly, with the Japanese Tony. If Denny DeWeese hadn't crashed on takeoff, they

(Continued on page 92)

Floating Around

by JOHN SULLIVAN



Tom Vincent's GO 4-cycle Dallaire slips by on a step run. Davis / Woodland Float Fly '88.

I FINALLY SAW Bill Price's* .40-powered PBY perform. The changes Bill had to make to his scale prototype typify the problems anyone faces when reducing a 12-man amphibious reconnaissance bomber to a model that fits into the back of a station wagon. Wing loading, beam loading and effective control surfaces got together to make life miserable for Bill. To reduce loading, he increased the wing area by 20 percent, and he tossed out the sync control, because it didn't work reliably. The rudder and elevator areas were increased by 25 percent, while still retaining the outline of the original. This turned a wallowing, yawing terror into a craft that tracks like a cat. The remaining problem—beam loading—was solved by lengthening the fuselage by 2 inches just in front of the wing pylon. The Catalina still chews up a little spray at the beginning of a run, but now it gets on step easily and high-speed taxiing is a joy to watch. All Bill's kits have these changes incorporated, but I had to see their effectiveness for myself, and now I'm a believer.

Recently, Bill made a change to his PBY that I recommend to all. He installed a rudder post and rudder just aft of the step, and this allows him to steer the PBY anywhere he wants it to go. Of course, all these changes remove Bill's model from the exactly-to-scale category, but that's OK with me. I've always thought that, as modelers, we adhere too much to form at the expense of performance. Designers of the full-scale PBY had to pay strict attention to wing loading and beam loading, so why shouldn't we do the same? If the game is to put every rivet in its exact place and then lose a day of our lives every time we fly for 15 terrifying minutes, that's one thing; but if relaxation is our goal, then we're better off approximating the craft we're modeling, building-in good flying qualities and enjoying life. Bill's PBY is flying so well now that you could almost put it in an *advanced* trainer category. The plane actually performs better than the 9-foot Cats I've seen. The flare at landing still requires a light touch, but aileron control is good right down to landing, so digging a tip float in is the exception rather than the rule.

Leroy Schedlbauer's scratch-built "The Whole Cake" spans 12 feet and is powered by an O.S. 120 4-stroke. Easy-going floater is covered with Sig Coverall and dope.

Augie Fabian and Gene Hughes brought Sig and Balsa USA clipped-wing Cubs to the Woodland Float Fly. (O.S. 120 Surpass and Zenoah G38 power.)

While I'm on the subject of twin amphibians, I have to tell you about a full-scale float fly-in that George (Field Marshall) Graff and I attended recently. As in the past, the meet was held at dear

old Clearlake, but, this year, there was a big difference, as Clearlake was chosen to host the *full-scale* float nationals. Talk about a circus! There were over 30 float planes and amphibians there—everything from little two-place Stinsons to an incredibly well-restored Grumman Albatross, with Cessnas, Tripacers, Lakes, Sea-Bees, Ultralights, a Widgeon and a Mallard in between.

The author revs up his Leapin' Lena while Myron Vandegrift holds O.S. 20 4-stroke power. Micafilm covering, balsa-sheeted foam floats.

The United States Floatplane Pilots' Association* sponsored the meet, and on Saturday afternoon, they scheduled a bomb drop and a spot-landing contest less than 150 feet off shore. Bear in mind that these are full-scale floatplanes and 150 feet is *nothing* when a twin-engine Albatross goes thundering by. This phase of the event just kept getting louder, more hectic and more bizzare until it started to resemble a sharks' feeding frenzy! At one point, I watched the Mallard cast off while two Ultralights flew overhead; a cigarette boat went flying through the bomb-drop course; a Republic Sea-Bee aborted its landing to miss the cigarette boat; a Lake Renegade went by in the opposite direction *towing a skier;* and, further out, the Albatross was spinning in circles with one radial at idle—absolute madness!

However, George and I recorded all the action on video and it's being offered through my Floatplane Products Company*. This is a great opportunity to see, close-up, a very broad spectrum of full-scale floatplanes and amphibians doing what they do best: Renegades charging up the ramp, Ultralights doing 180s, three Buccaneers flying in formation and those big Grumman twins—all make for a very exciting 100-minute VHS tape. If you're interested, drop me a line and I'll send you our brochure. In case you also want to contact the Floatplane Pilots' Association for a schedule of their '89 meets, I've included their address also.

Despite all the fast talk, this month's column focuses on old-timers. I hadn't seen one of these beauties fly until the Clearlake meet two years ago. I can't remember which old-timer flew (something huge with a 12-foot span and clear covering) but my initial impressions were the same as those of others who were seeing this facet of our sport for the first time: Here was an aircraft that could *really* fly on its wing—big, slow and absolutely majestic in flight. When I started out in R/C, working alone, this was the type of experience I was expecting. In reality, 15 seconds after my first takeoff, I was back to square one with a re-kitted trainer.

Since that first crash, I've persevered and brought myself to a level of flying

Harold Dew and Ed Seim display their scratch-built Aeronca Champs at the Fall '87 Woodland Float Fly.

proficiency that "needs work," but I have a good time. Someday, my name might be synonymous with trainer testing! Just think of the possibilities!:

Question: Name three tests commonly associated with psychiatry, medicine and R/C flying.

Answer: Rorschach, Pabst and Sullivan!

Flying abilities aside, at the Clearlake meet, I decided to try an old-timer, and the Leapin' Lena you see in this month's gallery is my first O/T attempt. The Lena was designed in 1953 by Fred Lehmberg* of Port Hueneme, CA, and Fred has been kitting the plane ever since. It has a 56-inch wingspan and, with floats, it weighs 4½ for a 19-ounce wing loading. Given that I used standard servos and a 500mAh battery, that's a pretty respectable weight for a small floatplane.

Karl Tulp's Dallaire Sportster glides overhead while Mike Johnson rows "Fish Meat," the Hennessy Pontoon's No. 2 recovery vehicle.

In choosing a pair of floats for the Lena, I broke my 80-percent rule, and my reasons are worth explaining: If you apply the 80-percent rule to the Lena's fuselage length, you come up with a 28-inch float requirement. The 28-inch float will support 5 pounds with reserve, so you'd think that would be the size to use. However, the Lena is very short and has a lot of frontal area relative to its length. It also has a lot of wing area for the wind to get under in a crosswind-taxi turn. For added stability, I moved up to a 32-inch float to improve tracking and increase the plane's "footprint" on the water.

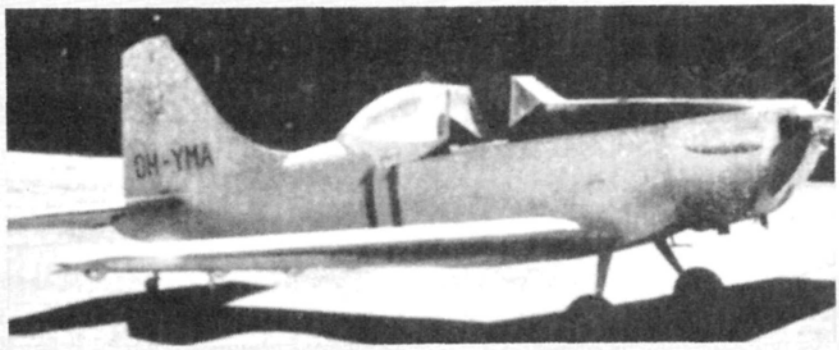
Everything has worked well. The little O.S.* 20 4-stroke pulls the Lena right off, and its flying qualities are agile but predictable. The rest of my current stable of floatplanes are ¼- and ⅓-scale, and it's a real pleasure and a refreshing change of pace to take this little plane to the lake on Sunday mornings. You can grab the plane with one hand, the transmitter with the other, and cast off without breaking your back. There's a lot to be said for this "small-steps" approach, and I recommend it highly, because it will put things

(Continued on page 124)

NAME THE PLANE CONTEST

Can you identify this aircraft?

If so, send your answer to Model Airplane News, Name the Plane Contest (state issue in which plane appeared), 251 Danbury Rd., Wilton, CT 06897.



Congratulations to John J. Schifko of St. Louis, MO, whose entry was chosen from among the eight correct answers received.

Although a number of readers identified the airplane as a Navion Rangemaster twin, it is actually a Monocoupe Meteor, manufactured in 1954 by the Monocoupe Aircraft Co., of Florida. Of all-metal construction, the 5-place Meteor was powered by twin 0-320 Lycomings, each with 5-place 150hp. It had a 36-foot span and a cruise speed of 175mph at 70-percent power.

The winner will be drawn four weeks following publication from correct answers received by postcard delivered by U.S. Mail and will receive a free one-year subscription to Model Airplane News. If already a subscriber, the winner will receive a free one-year extension of his subscription.

SCALE MASTERS

(Continued from page 89)

could have been chasing the Focke Wulfe! Anyhow, the video guys loved seeing the low, low passes, the near collisions (all controlled, of course), the tail-chasing antics and the beautiful victory rolls. The highlight was Gene Barton rolling his '51 inverted while at a height of only 54 inches! I've been known to do a low pass or two in my day, so I followed Gene, but I stayed upright and flew under him! Unfortunately, due to my failing eyesight, I didn't realize that I'd wandered a little toward the grassy area and my 2 inches of lower-scoop clearance dwindled to zero in a heartbeat! The result was a flat-out, full-speed, no-stall landing at about 75mph!

As well as Bob Fiorenze's impressive F-18, we were also privileged to see Bill Harris and Dennis Crooks put on a demonstration with an A-4 Skyhawk, an F-15 and Dennis's Blackbird. All these aircraft, including the F-18, are prototypes of kits that will soon be available from Yellow Aircraft*. (The A-4 is available now.) This was the first Masters final in a long time in which Dennis hasn't competed. I imagine that, had he been there, the final standings would have been somewhat different. But for now, Bobby Fiorenze is the winner, the top gun, el numero uno, el macho piloto, jocko premierro, and limelighto indamiddlelovo! He earned it, he deserved it and, next year, he's gonna have to defend it. If you thought "the Fireman" was nervous this year, just wait till next time!

Thanks to Dale Drew and Jim Wolfe for running a great contest, the two clubs for pulling together to help them, the contestants for putting on a great show, Harris for thinking up the idea in the first place and especially to Pacer Tech for having the foresight to get involved with such a prestigious competition. If you'd like to compete next year, it's really not too difficult; simply attend one of the many regional contests, place in the top five, arrange a week off work sometime in September, save $1,000 and drive to St. Louis in '89. See you there?

Until next time... check your six.

**Here are the addresses of the manufacturers mentioned in this article:*

Pacer Technology, 1600 Dell Ave., Campbell, CA 95008.

Futaba Industries, 555 W. Victoria St., Compton, CA 90220.

K&B Manufacturing, 12152 Woodruff Ave., Downey, CA 90241.

Yellow Aircraft & Hobby Supplies, Ltd., Suite 201, 3040 Palston Rd., Mississauga, Ontario, Canada L4Y Z26. ■

SMALL STEPS

(Continued from page 34)

interesting to take a poll on just which airplane holds the honor of being the most popular ½A trainer of all time. I vote for the Showmaster, by Ken Willard—that was *my* trainer the second time around. The polls are open; cast your vote! And, when you vote, why not send along some nice, glossy black-and-white photos, too!

A while back, I mentioned a computer program that crunched some numbers so the performance of different airplanes could be compared. A friend of mine offered a printout in Atari Basic for a dollar bill. Well, the heavy response was a surprise, and the program has been placed in public domain. Better still, Peter Clarke* has converted it to GW-Basic for all IBM-compatible computers using MS-DOS. Pete offers to send the IBM version on a floppy for just $5—a real bargain!

**Here are the addresses of the companies*

(Continued on page 99)

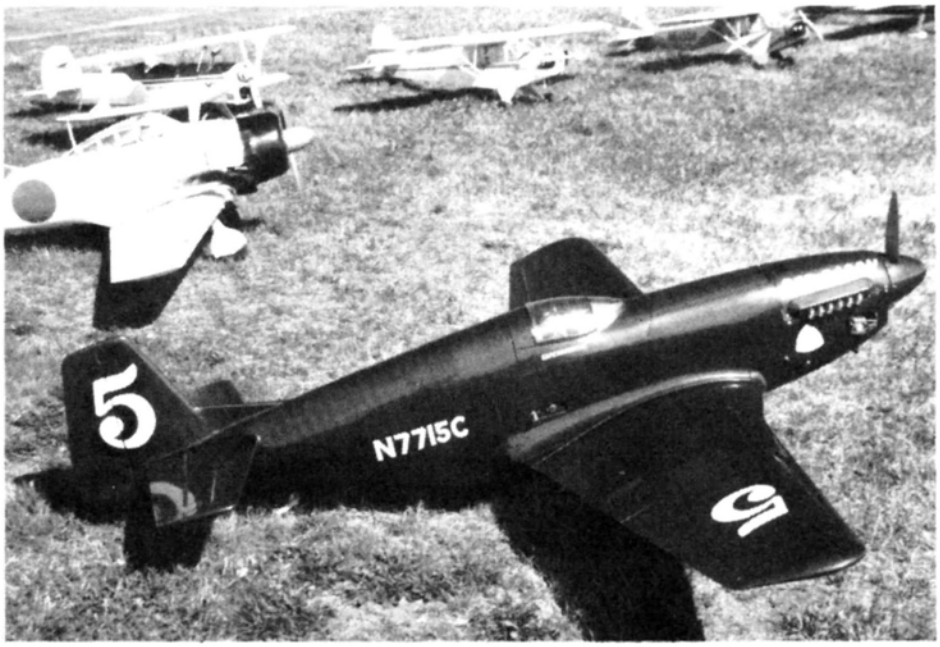
Giant Steps

by DICK PHILLIPS

IN THE PAST, I've mentioned the ever-increasing use to which computers are being put within the modeling hobby, and I recently received some information from Concept Technology* in Poway, CA. David Bessel, of Concept, enlarges plans for use in model building. Over the years, I've mentioned several firms that do this sort of thing photographically, and I've used some of their services myself. However, with photographic enlargement, the problem of distortion is difficult to avoid, and the process has recently become quite expensive. Concept scans the material supplied, and then, using a computer, mathematically enlarges the input to produce a plan at the required scale. This scale is controllable and can be any you want, within the capability of the output device (printer). This means that a normal-size three-view could be enlarged to whatever size is required to produce a plan from which to build a model. The lines tend to thicken, and an extreme enlargement could result in lines that would require some careful judgment about which part of the line to use.

With a three-view, the real value would be in providing scale outlines that could then be used to produce the plan of a model (depending on the scale fidelity of the original three-view, of course). The enlargement shown in the illustration is slightly more than 2½ times the original (2.63, to be precise). Despite the obvious thickening of the lines, I can see a real use for such a service. Using a three-view as the input, it would certainly provide a means of laying out accurate scale outlines for a model. Using such a service would save considerable time (and eliminate a good deal of possible error) in the preparation of a true "scratch" plan. Having accurate outlines goes a long way toward providing an excellent base on which to do the nitty-gritty design work.

Prices for enlarging an 8½x11-inch three-view range from $15 for up to a three-times enlargement to $60 for ten times. Large originals may also be enlarged and these prices are based on wingspan: A 4-foot enlargement costs $30, up to a 10-foot span for $70. In enlarging a full plan (one or two sheets are included at the price quoted), the result is another complete plan at the larger size. For example, if you have a plan at 1/6 scale and want to build the same model at 1/5 or 1/4 scale, Concept can accurately enlarge the original plan to the desired scale. Keep in mind that all material sizes will be increased appropriately in the process. The big advantage is that all shaped parts will also be increased to the desired size, thus making the construction of the model much easier. It sounds like a good idea to me, and one that isn't overly expensive.



Crash Evanson (St. Paul, MN) built and subsequently destroyed this modified P-51 he called "Red Baron." Part of IMAA Chapter 46 Show Team in the background.

In addition, David has a program called RCTOOLS, which has the ability to do a couple of useful things for those of us who either draw our own plans or scale plans to other sizes. Basically, the program will:

- operate as a scaling calculator, i.e., it will accept a scale factor and then, using the scale factor selected, convert measurements input at the keyboard. Handy!
- print out a scale ruler for use in scaling measurements off a plan (as I described in my recent articles on scaling-up plans).
- print grid paper at any square size selected (also very handy for scaling plans up or down).
- compute the area of a shape. This is done by graphing the shape onto graph paper, then inputting the ordinates for the shape from the graph into the computer. The area of the shape is then calculated and shown on the screen (also very handy, and solves my problem in determining the area of an elliptical wing plan; something I wasn't able to do when I designed a small program for calculating the wing loading of a model).

In addition to all these, David is working on a CAD program that will assist a designer laying out a design on paper. I don't have many details on this, but I'll pass along any information that comes my way. It's obvious that there are a number of people who are working on computer ideas and programs that will affect modeling. I know of several, and Colonel de Vries and I will be publishing a book (along with an optional disc) of

programs designed to be of use to model airplane builders.

In addition to the computer use mentioned above, I know of a program now being developed by a model builder, and this will not only assist in designing a model, but will also produce the necessary drawings. Within a year or so, the program will probably appear on the market as "MODELCAD." The program is *not* currently available, but I'll tell you when it is.

There's also a book in the works, and this should be published either late in 1988 or early in 1989; it provides a number of useful programs for model builders. The book is being prepared for publication by ViP Publishers*, and when it's available, it will be announced in the model press. The book includes some airfoil programs that produce a table of ordinates from which to plot the appropriate airfoil at the selected chord. There will be an assortment of programs available—most written in BASIC and tested on a number of CP/M and DOS computers. The book will be available with or without a disc, which will include the programs, rather than having to input them yourself. (Anyone who has input a lengthy program will appreciate the *real* value of having the programs on disc!) Also noted are the areas where variations in BASICs may require changes to operate with various flavors of BASIC. (Looks to be a handy and useful addition to any computer-using modeler's arsenal.) I'll be surprised if this sort of material doesn't increasingly become available over the next year or so. (There sure seem to be a number of modelers and computer users out there doing some interesting homework!) There are many good ideas and several programs in the book—all gathered and refined by Curtis Givens, of Dayton, OH. Curtis is a computer whiz, and we're looking forward to providing the book for model builders.

Written by Henry Haffke (an acknowledged expert on the Granville brothers and their high-performance airplanes), a new Gee Bee book will be released by ViP publishers early in 1989. Henry has been researching the Granvilles for almost 15 years, and he has had the help of the surviving members of the Granville family in putting the book together. Their assistance has included opening their family albums and scrapbooks, so Henry has had access to many previously unpublished photographs. In addition, the family (along with Gee Bee engineer, Pete Miller) has seen the text of the book and agree that it's an accurate rendering of the history of the brothers and their company. During his research, Haffke found that many of the tales told about Granville airplanes have been exaggerated or distorted over the years, and he has put considerable effort into laying some of these inaccurate stories to rest. It looks like a well-written book, and it will be a significant addition to the *accurate* history of the Granville brothers and their airplanes.

More progress on Jim Greenley's Grumman. Scale operating exhaust planned with 15-inch retracts and an up-rated 5.8 Sachs, putting out about 12hp. Starting to look really good.

As I write this (October), I'm planning to attend the QSAA Rally in Las Vegas, NV, and I'll report on this internationally known event in an upcoming issue. I missed last year (which was rained out), and I'm looking forward to attending again. I'll present a comprehensive report, along with a generous assortment of photographs. The Las Vegas venue attracts participants from all over the world and it's always well-attended. It's a chance to see many friends who come to the United States only for this event and to exchange ideas on model-building techniques. If you haven't managed to get there yet, give it a try next year.

You'll be reading this in December, so I'll take this opportunity to wish you all a very happy holiday season. I hope the new year brings you many opportunities to enjoy our hobby in good health. Speaking of the new year, if you haven't ordered your 1989 R/C Scale Calendar yet, you're missing an attractive addition to your office or workshop wall. Dennis Crooks (DC Aviation*) has produced another winner with 13 great scale model photos in an attractive calendar. Dennis wields a camera as well as he does a transmitter, and the photos are the kind you might consider framing for display (a great collecton of photographs of some of the best scale models around). Dennis will also print specialty versions of his calendar for your club (could be a nice little fund-raiser?).

**Here are the addresses that are pertinent to this article:*

Concept Technology, P.O. Box 669, Poway, CA 92064.

ViP Publishers, P.O. Box 16103, Colorado Springs, CO 80935.

DC Aviation, P.O. Box 98, Big Rock, IL 60511. ■

SMALL STEPS

(Continued from page 92)

mentioned in this article:

O.S.; distributed by Great Planes Model Distributors, 1608 Interstate Dr., P.O. Box 4021, Champaign, IL 61820.

Airtronics, Inc., 11 Autry, Irvine, CA 92718.

Ace R/C Inc., 116 W. 19th St., Box 511C, Higginsville, MO 64037.

Cox Hobbies, 1525 East Warner Ave., Santa Ana, CA 92705.

Peter Clarke, 1665 Greenleaf Ave., Des Plaines, IL 60018. ■

GOLDEN AGE

(Continued from page 43)

hope I've shown you that the arrival of complete proportional control was *the most major* advance in R/C. For the first time, full-scale flight could be exactly duplicated. Space Control was the father, but the offspring are also worthy of comment: the Sampey 404, *next* time!

Info from the '50s

Fred Mulholland of Tampa, FL, is another of our revivified OTers. Like many I hear from, Fred built and flew years ago, then had insufficient time, and now, in retirement, is again modeling and having the time of his life. He's very involved in SAM activities flying electric power, and now interested in OT R/C.

Today, *MAN* and other magazines offer educational books on modeling from which much can be learned about trends in modern equipment. Good stuff! Ever wonder what information was available in the early days? Fred provides an answer with three booklets on R/C from the mid '50s. Offered by *Air Trails* magazine and edited by the prolific Al Lewis, much of the material was provided by the venerable Howard McEntee and H.A. Thomas. The booklets are packed with radio schematics, "how-to" details for control systems, planes—you name it! For those interested in the details of early R/C, these booklets are a mine of information—*if* you can find them! The original cost was from 35 to 50 cents each!

I hope you'll enjoy the info on engine speed control that I found in one of Fred's booklets. It should show you how we stumbled along before the advent of today's carburetors. Remember, today's basic carb was introduced by the Mills diesel. The rotating barrel was actually an engine "shut-off" for free flight. I took the idea and elaborated it for use as a throttle with glow engines. This led to the Bramco throttle, which, in turn, led to the development of today's fine carburetors. The barrel style solved many problems, and fortunately, there are some sketches showing how several early engine control systems worked.

In Figure 1, for ignition engines, two speed points are shown. The engine ignition timer included two sets of points instead of the usual single set. One points set was adjusted and *locked* for low-speed timing—retarded. The other set was locked for high-speed timing—advanced. The primary of the ignition coil was run through a double throw switch operated by an escapement. Thus, on command, you could switch from low-speed to high-speed timing, and this use of timing for speed changing was very reliable. I remember Jim Walker using a pulse actuator to operate the switch; when pulsing, he had some low and some high speed, the median effectively providing an intermediate speed. In operation, it sounded as though his engine was *burping* along!

Figure 2 shows a system that was popular with glow engines. A few engines came equipped this way, but most were modified by their owners. There was a Bonner motor-control escapement that was used for the needed shut-off valves, and as you can see, there were twin needle valves. An air bleed was added to the fuel lines leading to these, and this was controlled by the escapement. In operation, only one needle worked, while the other was rendered inoperative by the air bleed. To use the system, the engine was peaked-out with the upper, high-speed needle. Then the fuel flow was switched to the low-speed valve; with this one, the mixture was *richened* to reduce the rpm as much as possible.

From your own experience, you should know that just richening the mixture didn't *greatly* change the rpm, but for the most part, these early R/Cs needed full

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MOTOR MAINTENANCE

Basics of Radio Control

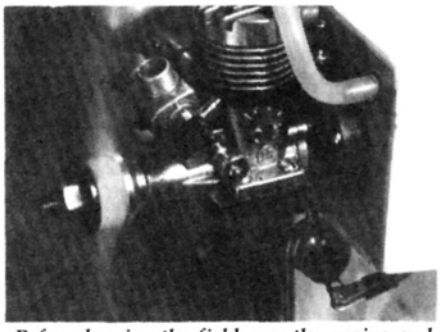
by RANDY RANDOLPH

SOME TIME AGO, I mentioned the First U.S. R/C Flight School*, and, to date, that school has trained nearly 100 students, with a graduation rate of 96 percent! Each student receives about six hours of training every day for the five-day period, and this includes over an hour of flight time in 10- to 15-minute segments during each session. The school provides the training airplanes, all fuel and back-up equipment, as well as a private field. The school's two K&B* .65 Sportster engines have flown their trainers for over 200 hours! One trainer has actually flown over 13,000 miles without damage. These numbers are impressive and prove the value of proper maintenance and care.

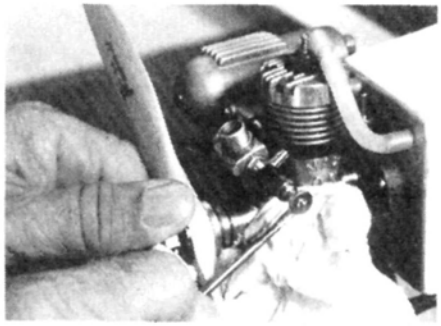
Even the smallest model represents a sizeable investment in time and money, and, if properly maintained, should deliver years of dependable performance. To ensure a long life for your R/C aircraft, there are some things that should be done *before* each trip to the field, as well as *after* every flying session.

Before any trip to the field, the first order of business is to check the radio and engine-starting batteries. Ni-Cd batteries lose the first 10 percent of their charge within a few hours after charging and at a slower rate thereafter. It's a good practice to allow at least 24 hours before a flying session for charging depleted packs, and at least a few hours for a booster charge on recently charged packs.

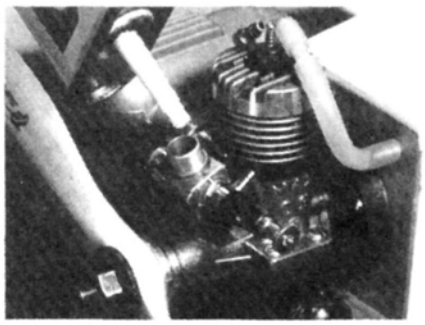
Most of us hang our models from the ceiling or walls of our shops when not in use, so they should be dusted before every flying session! That sounds rather silly, but dust on a model is very similar to frost on the wings of a full-scale aircraft; it's a drag-producing substance that can hinder performance.



Before leaving the field, run the engine and remove the fuel line to allow all fuel in the engine to be consumed.



When cleaning the engine, seal the tank to eliminate fuel leakage or contamination by cleaning materials.



A good after-run oil is essential to a long engine life. Work the oil into all engine bearings by flipping the prop several times.

In the hope of reducing crash damage, many modelers still use rubber bands to attach wings to their airplanes. As part of your pre-flight practice, check these vital items and replace them if you've any doubts about their condition. Similarly, if they're used for wing mounting, nylon bolts should be checked, as should the threads in the blocks that receive them.

Next, inspect all pushrods, servo connectors and clevises. External control-horn-to-clevis connections are always suspect because they're exposed to exhaust residue, and they collect dust and grit from the propwash every time the engine starts or the airplane taxis. The oily grit causes excess wear, enlarges the holes in the control horns and causes slop in the control system, and this can lead to flutter—a *very* destructive condition!

The last pre-flight inspection should include a check of all engine, carburetor, muffler and prop-mounting bolts, as well as the fuel lines and tank. Wheels should be checked for freedom of movement and tracking, and you should automatically check control response before each flight. Most experienced R/Cers do these pre-flight chores without even thinking; they've found it easier to fix any problem while still in the shop, rather than at the field.

Before leaving the field at the end of a flying session, start the engine and, while it's running, remove the fuel line so that the engine can burn all the fuel remaining in the crankcase. After the session, it's also important to clean the airplane

thoroughly. The best way to remove exhaust residue from the flight surfaces and fuselage is to spray a good glass cleaner on the surfaces, then wipe it off with clean paper towels. This should be repeated until no oil or dirt remains and the surfaces are clean. (Pay special attention to clevises and landing gear.) This is also a good time to repair or patch any dings or holes in the covering material.

A spray bottle of alcohol is handy for cleaning the engine and engine compartment. First, plug the carburetor air intake with a piece of paper towel to keep dirt from washing into this area. After washing, dry everything with paper towels.

Because model airplane fuel contains nitromethane, which leaves an acid residue, it's necessary to dose the engine with a good after-run oil. Using Marvel Mystery Oil or a good automatic-transmission fluid, fill the carb intake with oil and flip the prop to force the oil into the engine. Repeat this until all the bearings are well-lubricated. To reach all the bearings in four-cycle engines, the oil should be injected into the exhaust as well as the crankcase breather vent. Wrap the engine with a paper towel or a cloth to protect it from dust until your next flight session.

None of these chores requires much time, and the dividends are many years of trouble-free flying!

**Here are the addresses that are pertinent to this article:*

First U.S. Flight School, 521 S. Sawyer, Shawano, WI 54166.

K&B Manufacturing, 12152 Woodruff Ave., Downey, CA 90241. ■

GOLDEN AGE

(Continued from page 99)

power just to be *capable* of flight. Any reduction in rpm caused a descent and was therefore usable. As you can imagine, a major shortcoming was that the early engines tended to "flood out" when run rich, so with twin needle valves, reliability was poor.

Figures 4 and 5 show how ingenious early R/Cers could be. This idea is attributed to Claude McCollough (yes, that's Sig's Claude!)—two rotary valves that could easily be turned by an escapement. The outside tubes were stationary, while the inner tubes rotated, and rotation opened and closed passages to provide the desired functions.

Figure 4 shows a valve for use with twin-needle valves; it effectively switched fuel from one needle to the other without the use of an air-bleed system. This was a simpler and "tighter" method than the one shown in Figure 2.

To some extent, engine speed can be controlled by the volume of the air intake—commonly called venturi size. The rotary valve in Figure 5 switches between a maximum-size air intake for peak rpm and a much smaller one for lower speeds. (Note that there's an adjustment for the size of the low-speed intake.) Obviously, the output of this valve had to be "piped" to the engine venturi with no leaks allowed. A fuel-flow needle setting that would be compatible with *both* intake sizes was necessary with this system. Reducing the size of the air intake usually richens the mixture, so again, reliability was doubtful.

Figure 6 comes from OTer Carl Schmadig of New Jersey and shows another rudimentary device to restrict air intake: full speed with the clapper open and low speed with it closed. Again, note that there was an adjustment for the low-speed hole size. Adjusting an engine with these air-restricting devices was a great *compromise* between a usable needle setting and the low-speed hole size. This was so critical that you had to check the settings before *every* flight, and then hope that it would work until you'd safely landed your plane!

With single channel and escapements, there was always a search for a way to have a second control, i.e., engine. Figures 7 and 8 depict commonly used "delay" circuits. Using a rudder escapement, one modification added a simple switch that would close in one of the rudder positions. The switch closed a delay circuit, and if the rudder command was held for several seconds, the delay circuit activated a second escapement and engine control. The usual use of rudder control wasn't expected to be long enough to affect the delay. Figure 7 shows a bi-metal strip that created the delay, something like a pop-up toaster! That in Figure 8 is completely electronic, with an electrolytic capacitor to charge and create the delay. As can be imagined, it took a dextrous use of the rudder escapement to keep the delay circuit from operating when you least expected it to! Russian roulette again?

So what do you think? Isn't your modern engine just wonderful? Thirty years ago, you could have sold it for ten times what you paid today! Seriously; picture what early R/Cers had to contend with. They probably assembled their radios just *hoping* they'd work. If they were able to, they designed and built an R/C-type plane or adapted and built a free-flight design. They then conceived and reworked a C/L-type engine for R/C use. Most modelers expended a year's worth of toil and tears just to have *one* R/C model. No wonder they were so proud of their accomplishments!

Out of time for *old* time—until *next* time...! ■

PIECE O' CAKE

(Continued from page 48)

The first flight was beautiful: classic hand-launch to a straight climb-out and, in spite of the wind, *very* stable. Only a bit of down-elevator trim was required. The motor was shut down for some soaring and re-started for fly-bys and altitude gaining. Although we didn't find any that day, thermal-hunting with the P.O.C. is something we're looking forward to. We

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PIECE O' CAKE

(Continued from page 102)

immediately recognized that the little ARF was about the easiest airplane we could recall flying in recent times. As it's electric-powered, you could probably fly it anywhere with no problem. The silence, however, can be eerie!

OK, "simple to fly," say you guys who fly all the time. What about the beginner? Good point. The very next day, under much better conditions, we took the Air Age editorial staff out, *none* of whom had ever flown before, to see just how easy it was. Conclusion? None, yet! After the first flight of the day, the motor began running erratically and quit. We swapped packs, we checked switches, we blew the fuse! We ended up scrubbing the mission for the day, and we discovered that a lot of things have to be removed to gain access to the fuse. Recommendation? While assembling your P.O.C., either extend the wires to provide fuse access, or eliminate the fuse entirely.

We're still waiting for some better weather to try it again, but winter is nearly upon us, and although the P.O.C. can probably handle it, the epidermis isn't as willing!

Some Observations

- I had some concern about the lack of any provision for cooling the battery or motor. This hasn't surfaced as a problem, because the motor isn't continuously run, but cycled on and off, as needed. If the motor were continuously run, as in its original car application, the rapid battery discharge would cause heat build-up.
- Using a 540 motor will allow the use of the broad range of high-performance motors presently available for R/C cars. This will undoubtedly increase performance in the climb.
- The kit is well-executed and will make a great trainer that can be flown nearly anywhere because of its electric propulsion package.
- The instructions and the advertisements I've seen indicate that you can take the equipment from an R/C car, install it in your P.O.C. and go fly. *One* paragraph in the instructions addresses the issue of the difference between car (surface) and airborne frequencies. I don't think that will sufficiently "enlighten" some of the younger R/C car operators to the potential problems involved. Perhaps the saving grace might be that the tightness of installation itself might be a deterrent, causing the "cross-over" candidate to seek the help of someone—a hobby shop operator or flier, I hope—who will prevent him from flying his newly acquired flying machine with an illegal surface-frequency radio. Even worse is the possibility of his buying a "proper" airborne frequency radio for his P.O.C. and then later installing it in a car!

On its own merit, the Piece O' Cake ARF could turn out to be a great introduction to R/C flying, both for the guy who is just interested in airplanes and for the entirely new audience of formerly "ground-bound" R/Cers who see the excitement of getting airborne. Properly coached and encouraged, they'll be helped a great deal by the Piece O' Cake.

**Here are the addresses of the manufacturers mentioned in this article:*

Dynaflite, 1578 Osage, San Marcos, CA 92069.

Coverite, 420 Babylon Rd., Horsham, PA 19044.

Black Baron; distributed by Coverite.

Cox Hobbies, Inc., 1525 East Warner Ave., Santa Ana, CA 92705.

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PIECE O' CAKE

(Continued from page 104)

Zap; distributed by Pacer Technology, 1600 Dell Ave., Campbell, CA 95008.

Tamiya/MRC, P.O. Box 267, Edison, NJ 08818.

Kyosho; distributed by Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820. ■

QUIET FLIGHT

(Continued from page 52)

at an angle. Glue the remaining ribs into place, coordinating them according to the labeling that was done when the ribs were cut apart. Don't glue in the top center-section sheeting at this time. The center section must remain open for installation of the spoiler cables. The turbulator spars and spoilers are shown in place in one of the photos; they'll be installed when we finish construction next month.

Underweight Models

For years, we've striven to build our gliders as light as possible to get the best floating glide. In the past couple of years, the weight of our models has increased, and we're realizing the higher performance potential of higher wing loadings. But there are still many modelers who don't seem to believe in heavier models.

Among 2-meter pilots, I see a lot of hesitation to increase wing loadings. What really surprises me is that these pilots fly 2-meter 7-cell electrics, and never seem too worried about flying these models at 42 to 48 ounces. However, if you suggested that they fly a Gentle Lady at 42 ounces, they would probably laugh at you. I admit that at this weight, you'd have to be very careful during launch, but on several occasions, I've seen an electric Gentle Lady out-thermaling lighter 2-meter gliders.

I fly a 2-meter Gnome and keep ½ pound of lead on the CG, no matter what the conditions are. The only time I alter the weight is during windy conditions, when I increase it. There has been quite a bit of talk about flying heavier with models using modern computer-generated airfoils, but higher wing loadings can increase performance in flat-bottom models, too.

The best way to go about this is to increase your model's weight in ¼-pound increments. If you're flying a larger standard class or a 3-meter model, you should probably work in ½-pound increments. Anything less, and you'll see very little change in your model's performance.

After you've increased your model's weight, fly as many flights as possible. If you notice an increase in performance, the next step is to again increase the model's weight. When the model's performance starts to deteriorate, remove the amount of weight last added to the model.

I'll be willing to bet that your 2-meter model will fly better at a higher-than-stock weight. As I said earlier, take a look at the performance of 2-meter electrics, and you'll be able to see what a higher wing loading can do.

Till next month...good thermals and a full charge.

**Here is the address of the company mentioned in this article:*

Zap; distributed by Pacer Technology & Research, 1600 Dell Ave, Campbell, CA 95008. ■

AMA HELI NATS

(Continued from page 62)

kept him in the lead, and it soon became evident that every fraction of every maneuver was precisely done to the letter. For instance, on entering a loop, Cliff

adhered to a chosen altitude, exactly in front of the judges, as prescribed. He then proceeded to fly every quarter of that circle as if tracks were laid out in the sky for him to follow. When Cliff came out of the loop, his chopper was exactly where it had entered. I was beginning to understand that pilots like Cliff spend many hours planning, working out and practicing every minute detail of each maneuver.

Curtis Youngblood was plagued with problems in the first two rounds. A glow-plug burnout ended his first flight almost as soon as it had started. On his second round, Curtis couldn't quite lock into his usual level of precision, and this left only two good rounds to be counted. At this elite level of competition, Curtis needed a miracle that just didn't happen. Curtis' last maneuver could give us all a lesson in concentration. He was bringing his chopper down by way of a 180-degree auto into a precision spot landing. His focus was so intently fixed on getting the heli landing gear to meet the ground without any hover over the landing spot, that he kept arching backwards to avoid losing sight of it for a second, until he was almost on the ground himself!

Another dramatic flying round took place when Robert Gorham (of Gorham Model Products) was about to start his final round. While still in the starting circle, he discovered that the cylinder head was leaking. Robert had to correct the problem, start his machine and complete all the maneuvers in 13 minutes. The entire round was very intense, and he managed to pull it off with two minutes to spare. I talked to Robert later, and he said it might have been beneficial to have had his caller using a stopwatch of his own, to let him know how much time he had left. Horace Hagen agreed with this idea, because it would prevent disagreements about time. With the continuing high levels of proficiency and strict time limits, callers using stopwatches will probably become a must.

I talked with Cliff Hiatt (this year's AMA FAI winner), and he graciously set his winning X-Cell down in front of me and some other pilots. Cliff took the canopy off and talked about his method of construction. He said the ship was built straight out of the box: no modifications. To say this machine was meticulously built would be an understatement, as it was immaculate, inside and out. It looked as though it had never flown and was built for museum display only—extraordinary!

Earlier in the meet, a couple of enthusiastic hover lovers told me about Curtis Youngblood's hot-dogging ability. (The tales were just a little too tall for me to believe!) At the end of the flying competition, the field was open for fun flying and the truth was there to behold: Curtis *was* flying backward loops and backward rolls! I'd expected the chopper to windmill into forward flight, but not so. I don't know how he did it, but seeing *was* believing!

Those of you who've never attended or competed in the helicopter AMA Nationals, and may be saying that it's too far to travel or it costs too much, should reconsider. The experience of being able to see the mechanical wizardry and the flying artistry of these top-level pilots is priceless. There's no other way to connect with this number of top pilots in one place—and that's without even mentioning the fun of competing yourself. I had a ball!

**Here are the addresses of the companies mentioned in this article:*

Miniature Aircraft USA, 2324 N. Orange Blossom Trail, Orlando, FL 32804.

Gorham Model Products, 23961 Craftsman Rd., Calabasas, CA 91302. ■

ELECTRO UHU

(Continued from page 68)

sheaths are glued into place.

The wings are next, and, although they take longest to build, it's an enjoyable part of the building process. All the parts are die-cut, and, for the most part, they fit excellently. The construction is straightforward and easy to follow. The trailing

edge and spar are pinned to the board by crossing the pins in a way that doesn't push the pins through the wood. The root ribs are then drilled (5mm hole) to accept the wing joiner. The die-cut bottom center sheeting and plywood spar cap are glued onto the bottom of the wing and the root rib is glued into place using the supplied dihedral angle guide. The trailing edge is notched for the ribs, and this makes their placement easy and the glue joint very strong. The ribs and shear webs are then glued into place along the length of the wing. The plans call for the shear webs (which go out about two-thirds of the span) to butt against the inboard portion of each rib with about a ⅛-inch gap between them and the next rib. I usually cut new shears to fill this gap, but I *always* build review models according to the plan. If I didn't, it would be impossible to determine whether a manufacturer has made a mistake or not. (More on the shear webs later.) The sheet gussets are then glued to the tip rib; check the top spar for fit and glue it into place.

The wing is lifted from the board and, with the aid of a T-bar sander, the fronts of the ribs are sanded to a uniform length. Since the parts fit so well, I was surprised that the ribs weren't even. The auxiliary, or false, leading edge is then glued into place, and the wire joiner tube is glued into the previously drilled root ribs. The wing bolts go through the wing just behind the high point, where a 9/16-inch-wide shear web is glued into place right behind the wing joiner tube. This shear must be sanded to the shape of the corresponding rib before the top sheeting is fitted.

The center, top rear sheeting and spar cap are glued into place next. The plywood spar caps that I've mentioned are part of the wing sheeting and they reinforce the spars, top and bottom, at the root

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ELECTRO UHU

(Continued from page 109)

of the wing. An amazing feature of the wing is that all the sheeting is die-cut and fits perfectly. The false leading edge is carefully sanded to the contour of the ribs, and the top sheeting is glued into place, overlapping the false leading edge. The wing can now be lifted from the board, and the false leading edge on the bottom can be shaped. There's no sheeting on the bottom of the wing. The tips and pre-shaped leading edge are now glued into place and given a final sanding.

Next, the wing is joined with the wing wire and placed on the fuselage wing-saddle opening. When drilling the two wing-bolt holes, it's very important to keep the drill absolutely vertical. When the holes have been drilled, use an X-Acto knife to taper the hole opening. The screws are flat-headed to ensure that they fit flush with the wing surface. The blind-nuts are then glued to the bottom of the wing hold-down web. Although the instructions don't mention it, the final step in construction is opening the molded air vents in the fuselage. There are both inlet and outlet vents, and these are aero-dynamically designed to keep drag to a minimum. The weight of the unfinished airframe was only 21 ounces.

FINISHING: The model was sanded, starting with 220-grit sandpaper and ending with 400-grit sandpaper. The fuselage was primed with Pactra* Prep primer and I achieved a smooth finish with only two light coats. A final coat of Black Baron spray white was applied. The tail surfaces and the wings were covered with white MonoKote*, and the wing tips, rudder and elevator were covered with red MonoKote. Finally, the supplied water-transfer decals were applied to the wings and fuselage.

GEAR INSTALLATION: The servos were mounted on the provided plywood battery/servo tray earlier in the construction. The motor is bolted to the fire wall and the prop hub and spinner are mounted. The receiver and the Graupner on/off unit are both mounted under the battery/servo tray, and the switch is mounted just behind the canopy opening. The flight-system battery is mounted just in front of the servos on the top of the battery/servo tray. Everything is then packed in foam, ready for the first flight.

PERFORMANCE: The test flight took place on a beautiful Southern Californian morning—about 70 degrees, bright sun and light puffy clouds. On my first flight, I started with the 6-cell 1200mAh pack and was pleasantly surprised by the brisk climb-out. The model was rock-steady from the moment of launch, through three climb-outs, right up to the picture-perfect landing. Total air time, including power on, was about 20 minutes. During this test flight, I tried some stalling maneuvers that were straight ahead, with easy recovery, as soon as the model again reached flying speed. Thermal turns are smooth for a straight dihedral model, and the UHU must *really* be slowed in a turn to bring on a tip stall, from which it recovers very quickly.

The second flight was done using the 7-cell, 900mAh pack. The climb performance didn't change as much as I'd expected, but the forward speed under power was considerably faster. I could only get two full climb-outs with this pack, and didn't really see any advantage over the 6-cell pack.

As I stated earlier, I was concerned about the method of installing the shear webs, and I decided to test them with some high-speed descents. The airfoil on the UHU looks somewhat like that of an Eppler 193 and is capable of really moving out when you want it to. At an altitude of about 500 feet, I pushed the nose over and kept the model in a steady, fairly steep dive. When I came across the field, the UHU was really hauling! There was no flutter, and the subsequent pull-out caused no damage. A couple of weeks later, the real test of the wing took place. At about 200 feet, I experienced some radio interference, and the model went straight in from this altitude. Although the fuselage was totaled, the wing came through the crash with only a broken trailing edge. I had my doubts about the method of shear-web placement, but the wing proved itself to be strong enough.

The UHU is a complete-concept model, and everything you need is available as a separate accessory. It's a fast-gliding, stable model, suitable both as an advanced trainer and as a sport model. Even though it has a much higher wing loading, its thermaling ability is on a par with, or better than, most 2-meter electric sailplanes. If you want a complete, matched flight package that will satisfy the most demanding pilot, the Electro UHU will meet all your expectations. Not only does it fly well, but it also looks good doing it!

**Here are the addresses of the manufacturers mentioned in this article:*

Hobby Lobby International, 5614 Franklin Pike Cr., P.O. Box 285, Brentwood, TN 37027.

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ELECTRO UHU

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Graupner; distributed by Hobby Lobby.
Pactra (Plasti-Kote), 410 N. Michigan Ave., RM 1280, Chicago, IL 60611.
MonoKote; distributed by Top Flite Models, 2635 S. Wabash Ave., Chicago, IL 60616. ■

FIFTY YEARS AGO

(Continued from page 70)

Horton was featured testing a new retrieval system that would take the risk out of tricky landings. Instead of the craft descending in the standard fashion when the fuel supply expired, a parachute was deployed as soon as the engine quit. In another photo, Editor Charles Hampton Grant was trying to acquaint his gas-powered J3 Cub with Jesse Davidson's grizzly cub. No that's not a model's name, but a real grizzly cub with fur, four feet and big teeth. For some reason, I don't think this union was a success.

"Frontiers of Aviation," the column dedicated to covering the growth of full-scale aviation, featured yet another handful of new aircraft ranging from 100mph balloon-launched gliders to 200mph 21-ton transports. With military uses undoubtedly in mind, the Russians had developed a two-place balloon-launched glider that was capable of gliding at over 100mph. For surveillance or other military applications, this Russian glider, without the rumble of an engine, would be able to soar undetected over a strategic military zone. The Italians, trying to keep pace with the rapid advances in aircraft, constructed the world's fastest dynomometric car to run along a ¾-mile test bed at 90mph to test scale versions of actual craft at scale speeds. The Americans had also introduced a number of new aircraft, including the Grumman J2F-2 Amphibian, the North American "44" attack dive-bomber, the Seversky Envoy Fighter and the new million dollar Consolidated long-range bomber.

Whether you were involved in full-scale aviation or subscribed to *Model Airplane News* for the latest in model aviation, January 1939 was the midpoint of an aviation technology blitz from which airborne craft around the world would eventually benefit. Whatever your preference, *Model Airplane News* was there to cover it, 50 years ago. ■

SKY LARK

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won't give you any), Jim is well-known in various circles for various achievements. In the first place, he was Leo Loudenslager's right hand in building the first Laser (the *real* first Laser, or the *first* real Laser!) and his own Laser was built right alongside Leo's, so the airplanes are practically identical. Jim competed in national and world contests in the unlimited category, and he flew two-ship displays with Leo in air shows. Since Leo moved to warmer climes, Jim has continued his air shows, not only in his Laser, but also in a 160hp Long EZ. You all know what he looks like, because he's the distinguished airline captain a major carrier used in the TV commercial where the captain pauses to speak to a young passenger in the lounge. However, what's *really* important is that Jim spends more time with R/C planes than he does with either 727s or his full-size Laser and EZ.

First Flights

First, I'll be really honest about my flights with the Sky Lark: Standing behind the airplane with the box in my hand for the first takeoff, I was much more nervous than I was when poised at the end of the

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SKY LARK

(Continued from page 112)

runway with my hand wrapped around 1450 horses and the nose of my first Mustang out in front of me. I was really spooked!

I don't know what I expected from the Sky Lark, but intellectually, I knew it couldn't be as skittish and hard to control as my smaller, lighter ½A foam flier had been. In a strong wind, I had stood on the top of my car, while Jim Roberts flew pylon turns around me in severe turbulence, and he had nothing but praise for the airplane. So what did I have to worry about?—mostly, the unknown.

Knowing that the biggest problem in R/C is the old its-headed-at-me-which-way-do-I-push syndrome, I approached that problem before taking off. Friends had told me to keep the transmitter pointed the same way as the airplane, and this made sense, but I needed some practice. So I fired up the Magnum Pro .40 (this, after breaking-in, has been a sweetheart) and started taxiing in big rectangles. While doing that, I made believe the plane was in the air, making all the turns with coordinated rudder and aileron and moving my body to parallel the flight/taxi path.

During checking-out in full-size airplanes for which I haven't been really qualified (P-51, B-25, etc.), I'd sit in the cockpit for hours, visualizing touch-and-go landings. I'd move my hands and the controls and make believe the runway was out there and I was doing what was needed to get me up and down safely. The process would be so realistic that the adrenaline produced would make my legs shake, but I'd be ready for the real thing. The R/C taxiing appeared to have partly the same effect; in fact, I actually began to *prefer* reversing mental control inputs when it was headed at me, rather than turning my body.

I taxied the airplane around, with it bouncing and leaping through the slightly rough grass for nearly a full tank of gas—which is how long it took for the people watching me to tire of the exercise and go away. I didn't want *anyone* watching the first flight!

Incidentally, the kit comes with 2-inch foam tires, which, for an airplane this size, are barely rollers, much less tires. Knowing how rough the grass was, I substituted some 3-inch Du-Bro* Cub tires for the mains and a 2½-inch for the nose. That turned out to be an excellent move, because these tires handled the grass reasonably well.

Finally, the people were gone, and my excuses were, too, so I pointed the nose into the wind and moved the left lever forward. I'd already found that the best way to drive a straight line was to leave it alone—so I did. With full power, it skipped along for a second or two and then decided it had had enough of that and went flying. On liftoff, it showed no tendency to veer to the right or to the left, but it needed some climb angle or I'd be picking it out of a tree in a nanosecond. Gingerly, I tweaked just a shade of elevator, half expecting it to pull vertical, roll over on its back and dive into the swamp below. (The one with all my footprints in it!) Almost instantly, I knew I was into an entirely different ball game in R/C flying! A little up-elevator produced a little up-pitch; easy as that! A smidgen of aileron dropped the wing smoothly and gracefully, and the nose didn't immediately aim at the brown stuff. The airplane had also been able to resist the magnetic pull of the single tree at the far end of the field—something my early trainer couldn't do! Just then, I heard an explosion of air very close to me, and I realized I'd been holding my breath since bringing the throttle up. Now, calming down, I felt I could breathe again.

I had worked out my flight plan before getting out of the car, and I stuck with it. I flew nothing but left-hand rectangles around my position, becoming more relaxed with each lap. At first, it was simply amazing that I was off the ground at all; then I started playing with the airplane to see how it would behave.

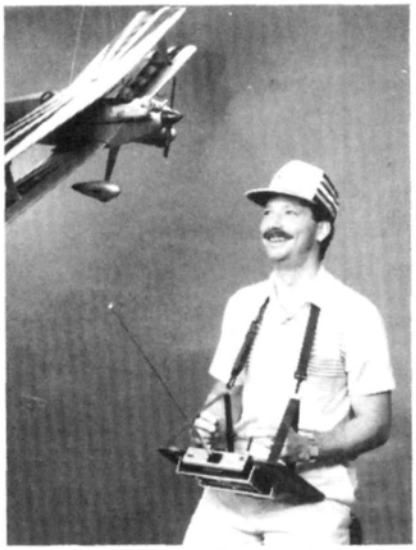
First, I flew straight ahead and more or less level (needed a touch of up-elevator trim), hands-off. When Jim was flying the airplane, he would rack it into a bank or pitch it up and it would recover on its own, and I really appreciated this on my first flight.

Another thing I appreciated about the airplane is that whatever it did, it was smooth and slow enough for me to correct it (that includes my own inputs!). A couple of times, I *did* drop the wrong wing, but the airplane was large enough for me to see my mistake instantly, and it let me correct with no fuss. In the same situation, my ½A job would have wrapped into a spiral before I could correct it.

Around and around I went, until I began to worry about running out of fuel. Throttling back, I cranked the plane into the wind and watched as it set up its own glide path. As I broke the glide, it was obvious that the elevator wasn't nearly as effective as it had been in normal flight,

(Continued on page 122)

Product News



B&J ENTERPRISES TRANSMITTER TRAY

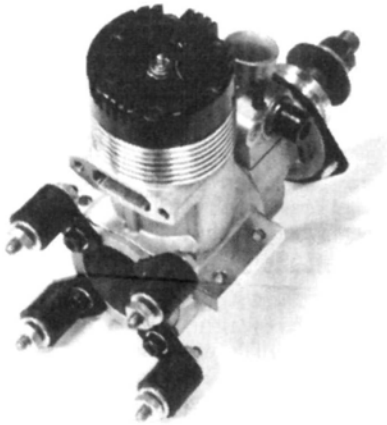
B&J Enterprises is proud to announce its new XT-1 Transmitter Tray. This sleek, new, lightweight design is padded with an elegant vinyl upholstery cover and has an adjustable neck strap, making it comfortable and attractive to wear. The XT-1 tray will fit most radios and comes in two colors: black or rust.

For more information, contact B&J Enterprises, 1100 Center St., Havre, MT 59501.

J'TEC SNUF-LER MUFFLER

J'TEC has introduced a low-cost, easy-to-install, lightweight muffler to reduce noise with no performance penalty. This Snuf-ler muffler is constructed of thin-walled steel and has a chemically applied heat- and corrosion-resistant black finish. Three chambers, separated by perforated baffles, combine with the single-chamber stock muffler to lower decibels with no power loss and, in some cases, to increase rpm. It combines with any .25 to 1.08 O.S. Max, Super Tigre, Enya, Fox, K&B, Royal, ASP or Irvine stock mufflers.

For more information, contact J'TEC, 164 School St., Daly City, CA 94014.



PERFORMANCE PRODUCTS VIBRA-DAMP

Vibra-Damp is a universal vibration-isolation mount. Performance Products has devised a mounting system that will reduce vibration more effectively than any mount used in the past. Tests show that a solid engine mount transfers all of the 95 Gs that the engine produces to the airframe, whereas Vibra-Damp reduces the transmitted vibrational G-force to 11 Gs! With this complete mounting system, the benefits of an isolated engine mount are no longer just for the competitive flier, but for sport fliers as well. All hardware to mount the engine to the fire wall is provided, including a front limiter ring recommended for .60-size engines. All the components of Vibra-Damp are completely fuelproof, and the mounting straps and front ring are molded from a space-age reinforced plastic.

For more information, contact Performance Products Unlimited, 7093 E. Dodge Rd., Mt. Morris, MI 48458.

PARRISH AIRCRAFT MINI-JET SERIES

Featuring all-balsa construction, these planes are designed with the intermediate flier in mind, and they'll accept a .20- to .25-size engine (use rear exhaust for exceptional performance). Get all the thrills of a jet, without the hassles of a ducted fan. F-20 Tigershark and A-4 Skyhawk versions are available.

For more information, contact Parrish Aircraft, 1125 S.W. 49th Terr., Plantation, FL 33317.

KYOSHO CONCEPT 30 HELICOPTER

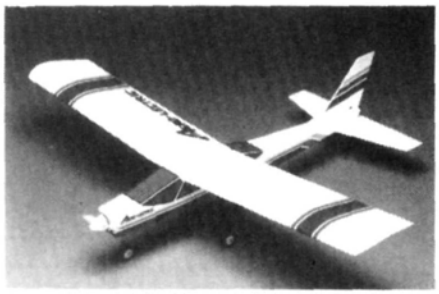
With their first entry-level model in the R/C helicopter category, Kyosho has brought chopper flight to pilots of all skill levels. The revolutionary Kyosho Concept 30 helicopter sets new standards in design, construction, operation and performance. For novice fliers, the Concept 30 DX is available mostly assembled, with or without an O.S. .28 F-H ABC engine already installed. A DX kit version is also available. The Concept 30 SE kit, for experienced pilots, features full ball bearings and a nylon stabilizer for improved aerobatics. An O.S. .32 F-H engine is highly recommended for the SE model.

For more information, contact Great Planes, P.O. Box 4021, Champaign, IL 61820.

BALSA USA PIPER L-4 GRASSHOPPER

Balsa USA announces the release of its Piper L-4 Grasshopper. This ¼-scale kit has a wingspan of 9 feet, weighs 12 to 14 pounds and will accept engines ranging from .80 to .90 2-cycle or .90 to 2.0 4-cycle. The kit includes full-size rolled plans (3 sheets), instructions, decals, die-cut and machined parts, formed wire parts, ABS cowl and hardware. The L-4 is a good-looking, easy-to-build kit that you'll be proud to take to the field.

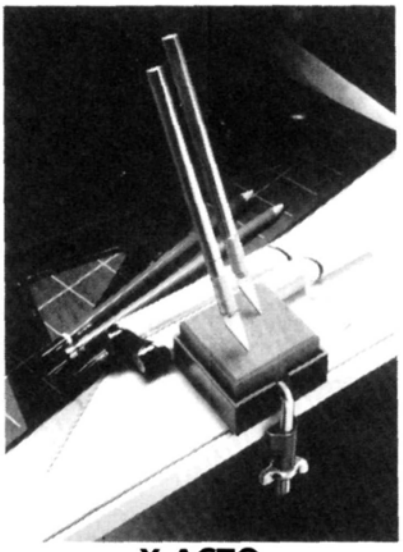
For more information, contact Balsa USA, P.O. Box 164, Marinette, WI 54143.



MIDWEST PRODUCTS AERO-LECTRIC

The modern design of the Aero-Lectric is based on the popular Aero-Star .40, which is known for its ease of construction and superior flying characteristics. This Success Series kit features micro-cut quality wooden parts that are 90-percent pre-cut; rolled plans; bagged parts; and the Success Series construction manual that's actually a handbook on R/C building and flying. And just like the Aero-Star, the Aero-Lectric will recover to a normal glide simply by closing the throttle and letting go of the sticks. The Aero-Lectric is a deluxe kit that features all the hardware items necessary to complete the model.

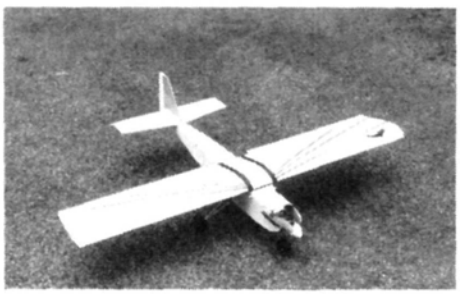
For more information, contact Midwest Products Co., Inc., 400 S. Indiana St., P.O. Box 564, Hobart IN 46342.



X-ACTO KNIFE STATION

The X-Acto Knife Station, a special wooden storage block and lightweight plastic casing, is a safe and convenient storage device for hobby knives. It measures 2¼x2¼ inches and fits on a drawing board, desk top or most taboret trays with either its sturdy aluminum clamp or self-adhesive pad. The point-down storage reduces the chances of accidents, yet keeps the tool upright and ready to use.

For more information, visit your local hobby shop.



CAMBRIDGE MODEL AIRCRAFT DOLPHIN SUPER

The Dolphin Super is a high-wing aileron trainer that's built like a conventional model airplane, but is RRF (*really* ready-to-fly). This aircraft is extremely stable and maneuverable with a slow flying speed to allow the new pilot time to think when trouble arises. The plane is constructed of high-quality balsa with veneer-covered foam wings and pre-hinged surfaces (Robart steel hinge pins). The Dolphin comes completely covered with heat-shrink film (Solarfilm), so you can make repairs easily. The aircraft takes four to five hours to complete from start to finish, and the kit includes wheels, gas tank, push rods, engine mount and all necessary hardware.

For more information, contact Cambridge Model Aircraft, P.O. Box 26, Norwood, NJ 07648.

COX HOBBIES .049 & .09 MEDALLION

Upgraded expressly for sport fliers, both the .049 and the .09 Medallion engines now include muffler and throttle. With the front rotor, the Medallions offer the higher performance and smoother running that experienced modelers require for their precision airplanes. These quiet, impressive Cox Medallions provide the quickness and responsiveness that advanced R/C flying demands, without creating objectionable noise levels.

For more information, contact Cox Hobbies, Inc., 1525 E. Warner Ave., Santa Ana, CA 92705. ■

Descriptions of new products appearing in these pages were derived from press releases by the manufacturers and/or their advertising agencies. The information given here does not constitute endorsement by **Model Airplane News,** or guarantee product performance. When writing to the manufacturer about any product described here, be sure to mention that you read about it in **Model Airplane News.**

SKY LARK

(Continued from page 115)

and I was fast because the airplane wanted to keep on flying. The first landing was a three-point drop out of a balloon, and the second was one I wished I'd filmed, because the prop didn't even get caught in the grass, and it took me a second to realize the engine was still running.

I made up for this good landing on the third, and final landing. While flaring, I somehow got a wing down and it caught the grass, quickly cartwheeling the airplane. It wasn't a hard cartwheel, and the airplane wasn't going very fast, but it still trashed both ends of the fuselage. The wings and tail surfaces didn't have a mark on them, but the last foot of the fuselage would have to be built from scratch.

I have no other trainers to compare the Sky Lark with, but I can say this for it: It really *is* a trainer. Its construction easily allowed me to add R/C techniques to what I knew from Ukie models, and in less than one flight, it showed me that, yes, I *could* fly R/C. It showed me that R/C isn't reserved for supermen—regardless of what Uravitch had told me! It gave me confidence very quickly and let me learn as I went along, and this is the role of a trainer.

Thoughts on Self-Taught R/C

R/C isn't something to go into without a certain amount of tenacity. The learning period can be a real pain in the tail—especially when suffered alone—because there's just so much to learn and so much of that is learned the *hard* way. It's also a tough period, because a lot of time is spent preparing or cleaning up the pieces, and very little time is actually spent flying. That's where an organized effort with someone owning a buddy-box would be well worth the time, since the airplane lasts longer and more time would be spent flying than building. The better you get at flying, the less building there is to do, and the cycle feeds on itself. Yes, learning on your own is possible, and it provides a certain amount of fun and challenge, but it involves a lot of unnecessary effort. Go find someone with a buddy-box, and don't mess around with this macho approach.

I also found this old adage to be true: "The bigger they are, the easier they fly." Within certain parameters, that's the way it is with full-size airplanes, and that's the way it was (in my experience, anyway) in the R/C arena. Even though I'm not even good enough to be considered a beginner, I can tell you this: I wouldn't put anybody out there with anything smaller than a .25-size ship. The smaller birds are just too twitchy for beginners. Maybe the powered glider types are OK, but I still think bigger airplanes are easier to handle. They're more stable, and they react more smoothly and more proportionately to commands. They just fly more like airplanes. When I made the step from a ½A to a .40, I thought I'd died and gone to heaven. Also, avoid the two-stick approach (elevator on left stick). Do very much of that, and it becomes hard to "un-learn."

One bad thing about a balsa ARF like the Sky Lark is that when it breaks, it takes a lot longer to repair. I'd really prefer to see a .35- to .40-size *foam* ship since these are easily repaired with epoxy and fiberglass. I don't know of any on the market, but I'm looking.

I'm sure a lot of you see learning R/C differently, but, as one who has waded through more than his share of swamps (physically and psychologically) to get a few good flights in, this is the way I see it. Now I need a pal with a buddy-box!

**Here are the addresses of the manufacturers mentioned in this article:*

Thunder Tiger; distributed by Global Hobby & Supplies, 10725 Ellis Ave., Fountain Valley, CA 92728.

Aristo-Craft Products; distributed by Polk's Model Craft Hobbies, 346 Bergen Ave., Jersey City, NJ 07304.

Du-Bro, 480 Bonner Rd., Wauconda, IL 60084. ■

BYRON EXPO '88

(Continued from page 87)

scale airplanes were timed perfectly with spectacular explosions. Even though I knew what was about to happen, the sharp presentation made it all seem new. "Striking Back" now rivals Hollywood's best special effects—and Byron's staff does it all *live!* It's a most impressive show and model-airplane flying is enhanced by all of it.

Of course, the Byron B-29 was a big part of this year's presentation. As incredible and sophisticated as that behemoth is, one was certain its flights would go well and they did. Were it not for its size, the B-29 would give every appearance of flying as easily as an Ugly Stik; it was *that* stable and smooth. Each flight was a study in preparation and concentration and, in the hands of Ken Bryant, the B-29 responded beautifully. It was great!

(Continued on page 124)

BYRON EXPO '88

(Continued from page 122)

I'm planning another Ida Grove visit in 1989—it never ceases to amaze and entertain me. I hope you'll be there as well!

**Here are the addresses of the manufacturers mentioned in this article:*

Byron Originals, P.O. Box 279, Ida Grove, IA 51445.

Bob Violett Models, 1373 Citrus Rd., Winter Spring, FL 32708.

Jet Model Products, 304 Silvertop, Raymore, MO 64083.

MonoKote; distributed by Top Flite Models, 2635 S. Wabash Ave., Chicago, IL 60616.

Taylorcraft, Ltd., 216 Willow Ave., Roseville, CA 95678.

O.S.; distributed by Great Planes Model Distributors, 1608 Interstate Dr., P.O. Box 4021, Champaign, IL 61820.

Walt Moucha Models, P.O. Box 112, Menominee, MI 49858. ■

FLOATING AROUND

(Continued from page 91)

in perspective for you, once in a while.

However, the Lena doesn't quite make it into the floater category, so I've included three other old-timers in our gallery, and these definitely fill the bill. Two are Dallaire Sportsters, built from a ½-scale kit produced by Lauren Schmidt of Walnut Grove, CA. The Dallaire is flown by Karl Tulp, and, as it's a local model, I've managed to obtain specs on it: It has a 9-foot span and weighs 6½ pounds. The Sportster is powered by an early O.S. 60 4-stroke swinging a 14/8 prop. The prop holds the motor down to about 5000rpm; that's all the power the plane needs, and the 4-ounce tank easily gives Karl 15- to 20-minute flights. Karl flies the Dallaire with regular 4-stroke fuel, and with the reduced rpm, he can plan on the O.S. lasting forever. Karl first mounted the Dallaire on 36-inch foam floats that he cut himself. The flotation was adequate, but the small "footprint" allowed the Dallaire to nose-over on the takeoff about half of the time. Karl substituted a pair of 44-inch Sullivan floats and this solved the problem. Apart from a layer of reinforced packing tape on the bottom, he left the floats bare. This annoys the purist in me, but I have to admit that the application is simple, extremely light and perfect for use on the Dallaire. Karl's fly-bys with the Dallaire are a joy to watch; each seems to take about five minutes. On several occasions, he has run the Sportster out of fuel and landed dead-stick. Every time it happens, we all stop to watch this beautiful old bird laze around in the sky and finally touch down. It's so fascinating to watch that you can usually hear the proverbial "pin" drop when he comes down.

The other Dallaire shown is by Tom Vincent, and it's equipped with Hanson floats that I think were cut by Bill Westphall in Washington. It's also powered by an O.S. 60 4-stroke, but came in at 8 pounds. Surprisingly, the additional 1½ pounds don't seem to change performance that much. In the picture I've included, Tom was in the middle of a 100-foot step run with a very slight crosswind. The shot was taken at the Woodland/Davis Modelers' Full Float Fly held at Mavis Hensen Field in Northern California, and I've included some other shots from that meet. These are a really fine bunch of people with an incredible facility that caters to every facet of model aviation, and I really appreciate their efforts. If you'd like to receive their newsletter, or to swap yours for theirs, contact Cy Jannke*.

(Continued on page 126)

FLOATING AROUND

(Continued from page 124)

Since this issue will be available around the middle of December, I wish all of you a great time during the holidays. If you haven't already done it, make a resolution to try float flying in '89. Interest in electric float flying is picking up at our site, and I expect to have reports on that soon. If any of you have electric experiences you'd like to share, send me a note and some black-and-white pics, and I'll try to include them in a column.

**Here are the addresses that are pertinent to this article:*

Bill Price, 455 Sunset, Angwin, CA 94508.

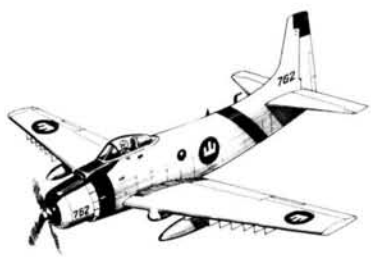
United States Seaplane Association, Box 30091, Washington, D.C. 20014.

John Sullivan Model Floatplane Products, 1421 Second St., Calistoga, CA 94515. (707) 942-5095.

Fred Lehmberg, (805) 984-6639.

O.S.; distributed by Great Planes Mo Distributors, 1608 Interstate Dr., P.O. B 4021, Champaign, IL 61820.

Cy Jannke, 1317 Stewart Rd., Sacramen CA 95864.



Classified

WANTED: RTF U-Control planes from Cox, WenMac, Comet, Aurora, Testors, etc., complete or pieces, buy or trade. John Fietze, P.O. Box 593, Lynbrook, NY 11563.

WANTED: Model airplane engines and model race cars made before 1950. Jim Clem, 1201 E. 10, P.O. Box 524, Sand Springs, OK 74063; (918) 245-3649.

SCALE DOCUMENTATION: Plan Enlarging. Photo packs, 3-view drawings for 1,600 aircraft. Super-scale R/C plans for Giant, Sport. 60-page catalog $4. Scale Plans and Photo Service, 3209 Madison Ave., Greensboro, NC 27403; (919) 292-5239.

CUSTOM EMBROIDERED PATCHES. Your design made any size, shape, colors. 48 patch minimum. Free random sample and brochure. Hein Specialties. 4202K North Drake, Chicago, IL 60618-1113.

BEGINNERS, discouraged by too-fast "trainers"? Send $1 and two stamps for no-holds-barred evaluation of 30 popular R/C trainers rated for their ease-of-flying. Jim Waterman, 3818 Deerfield Dr., San Antonio, TX 78218.

PLANS ENLARGED, Large Scale Specialists. Model Drafting Software, PC Model Software. Free catalog. Concept, P.O. Box 669E, Poway, CA 92064; (619) 486-2464.

WANTED: Berkeley and Cleveland kits or related items: parts, plans, boxes, brochures, books, ads, radio equipment, accessories, etc. Gordon Blume, 4649-191st Ave. S.E., Issaquah, WA 98027.

GIANT SCALE PLANS by Hostetler. We fly what we draw. Send SASE to Wendell Hostetler's Plans, 1041 B Heatherwood, Orrville, OH 44667.

SCALE MODELERS/AVIATION BUFFS/COLLECTORS Dimensioned scale drawings by William Wylam; all soft-bound in the "Scale Models" book. Features Grumman classics F2F and F3F; Seversky P-35' Waco "C" and "D" models; Wedell Williams Racer, plus other famous aircraft. Even includes detailed drawings of P&W Twin Wasp and Wright Whirlwind engines. Out-of-print collector's book—very limited quantities. Send $7.95, add $1.75 S&H; Foreign Surface Mail, add $2.75; Foreign Airmail, $5.50. Payment must be in U.S. funds drawn on a U.S. bank or by an International Money Order. Air Age Publishing, Inc., 251 Danbury Rd., Wilton, CT 06897.

AIRCRAFT RESEARCH—Need documentation? Send the name of your favorite aircraft with $2 for 3-view and photo lists. Mr. I.A. Ross, 1447 Helm Crt., Mississauga, Ont., Canada L5J 3G3.

FOR SALE: *Model Airplane News, Flying Aces, Air Trails,* 1934-1960, others. $1 for list. Bruce Thompson, 328 St. Germain Ave., Toronto, Ont., Canada M5M 1W3.

ANTIQUE MODEL IGNITION ENGINES—PARTS CATALOG, 50 pages, precision cast timers, original cylinder heads, point sets, drive washers, spark plugs, tanks. Many engines listed. Large catalog $4 plus $1 Shipping, Foreign: $8, Chris Rossbach, RD. 1 Queensboro Manor, Gloversville, NY 12078.

WANTED: 28-48 Model Kits, Engines, Magazines, Racecars. What do you have? Richard Rundell, 2933 Daneland St., Lakewood, CA 90712.

FREE PIN/PATCH WITH MERCHANDISE ORDER! WWI to present; catalog $1, refundable. Company of Eagles, 875A Island Dr., Suite 322T, Alameda, CA 94501-0425.

ELECTRIC FLIGHT EQUIPMENT: The best and largest electric flight supply in the Northeast. Specializing in ASTRO FLIGHT Equipment. Send $2.50 for Catalog to CS Flight Systems, 31 Perry St., Middleboro, MA 02346.

WANTED: Working old RD-049 ducted fan unit and engine. Any reasonable offer accepted. Orn Kjaernested, Graenas 1, 260 Njarovik, Iceland.

ALL ALUMINUM P-51D Mustang Precision ¼ replica scale R/C kit. Extraordinary museum detail and a thrill to fly! All aluminum chemically milled and cut-out/drilled/formed—ready for assembly. Three sold to date. Complete kit $3000. (Less engine & radio) Sample rib section and details $25 or SASE for info. Warbirds, 122 Naubuc Ave. (NAP Bldg.), Glastonbury, CT 06033 (203) 659-1920.

OLD TIMERS, take a ride back in time to airplane modeling roots with this vintage book—*Gas Models.* A true collector's book from the early editors of *Model Airplane News.* It contains the best of modeling from the 30s and 40s, including great technical information and classic construction articles from the Golden Age period. $7.95, add $1.75 S&H; Foreign Surface Mail, add $2.75; Foreign Airmail, $5.50; Payment must be made in U.S. funds drawn on a U.S. bank or by an International Money Order. Air Age Mail-Order Service, 251 Danbury Rd., Wilton, CT 06897.

HARRY HIGLEY Book Clearance Sale. *Tom's Techniques* by Tom Ingram and Harry Higley. All about applying plastic film covering and finishing in all areas, including ailerons, fillets, radial cowls, wing tips, etc. Step-by-step photos. Reg. $10.95: clearance, $7.95 plus $1.75 S&H. Air Age Mail-Order Service, 251 Danbury Rd., Wilton, CT 06897.

R/C WORLD—ORLANDO, FL, CONDO RENTALS—2 and 3 bedroom-furnished. Available weekly or monthly. Low rates. 100 acre flying field with enclosed hangar. Swimming pool, tennis courts on site. Minutes from Disney World and Epcot Center. For information call Allison, (800) 243-6685 or write to Air Age Inc., Condo Dept., 251 Danbury Rd., Wilton, CT 06897.

BEST SELECTION OF IMPORTED DIESEL ENGINES. Current production Aurora, D-C, Enya, MK-17, MVVS, KMD, PAW, Pfeffer, and Silver Swallow. Mills and Taplin Twin replicas. Also rare imported glow engines. Catalog $1. CARLSON ENGINE IMPORTS, 814 E. Marconi, Phoenix, AZ 85022.

AERO CLUB OF ISRAEL modeling flying needs your support, send SASE for Newsletter and information. NEW Friends of the Aero Club of Israel, 79-02 C 212 St., Bayside, NY 11364.

4"x8" VACUUM FORMER with self-contained hea source. Easily constructed from local materials. Plan $12. Complete unit $45 postpaid. GRACO MODELS Box 18358, Kearns, UT 84118.

COMPUTER PROGRAM: PATTERN MASTER– Use your IBM P/C compatible to make cutting patterr for aircraft covering. Program and user guide $24.9 demo version (includes $5 coupon for full version) $ Chandero Systems, 14 Parkview, Long Valley, N 07853.

"HELLO HOVER LOVER," This is for the pilot with passion! THE ALL NEW 1989 HELO-CALENDAR. makes a wonderful gift, especially if you want to conve a fixed-wing friend! Pictures are Hi-Gloss and each col picture is suitable for framing. Includes trivia and da facts, full-size and R/C. Measures (8.5"x11"/ 11"x1 open). This new 1989 HELO-CALENDAR shou make a welcomed addition to any work bench, shop hangar. Send $10 U.S. monies, check or money orde outside continental U.S. add $2 postage and handling t The R/B Bunch, P.O. Box 27082, Memphis, T 38127-0082.

WANTED: PILOT KIT—Sky Loop 404L plans or k Will borrow. Prefer buying. Bob Young, 121 Alle Lovington, IL 61937.

Send ad and payment to *Model Airplane News,* 251 Danbury Rd., Wilton, CT 06897. **Non-Commercial classified a** (commercial ads of any kind not accepted at this special rate). Rate: 15 words or less, $4.50 payable in advance. No char for name and address. Additional words, 25¢ each. **Commercial classified ads** (rate applies to anyone selling or commercial basis—retailers, manufacturers, etc.) Rate: 50¢ per word, payable in advance. Count all initials, numbers, nar address, city and state, zip and phone number. **Closing Date** for either type of ad is the 20th of the third preceding month (example, January 20th for the April issue). We do not furnish box numbers. If you would like your ad to run in more than c issue, multiply amount of payment by number of months that ad is to run. It is not our policy to send sample copies of t sheets.

Club of the Month

St. Louis Radio Control Flying Association

The St. Louis Radio Control Flying Association from St. Louis, MO, is the *Model Airplane News* "Club of the Month" for January 1989.

They were chosen as the host club of the 1989 U.S. Scale Masters Championships—a testament to the quality of this club. Their flying field has paved runways, and a new pavilion provides a meeting place or shelter from the rain. Construction of the new pavilion was headed by club member Ron Lawson, and, with the help of a number of other members, was completed in three weeks. The hard work and dedication demonstrated by the members of the SLRCFA will ensure the long life of model airplane flying.

The club's newsletter, "Rotate," is edited by Tom Denham and Mick Russeck. "Rotate" covers all the club happenings from coming events to club meetings, and includes a few instructional columns on aerobatics and model-airplane construction. A short write-up, called "Choosing an Engine," by David Denham (similar to our engine "shoot-outs") was included in this edition. David's article covers some of the details and basic performance data for seven of the most popular .40-size engines. Technical articles like these are of great use in choosing the items best-suited to you and your airplane. Keep up the good work!

The staff of *Model Airplane News* is proud to award two, free, one-year subscriptions to the St. Louis Radio Control Flying Association, to be awarded by them to a couple of the club's outstanding members.

P.S. These members should want to go to the meetings *without* the lure of go-go dancers and free beer! ■

Each month **Model Airplane News** will select the club newsletter that best shows the club's activities and energies directed toward the furtherance of the hobby. The award is not based on size or quality of the newsletter, and can be about any aspect of the hobby (F/F, C/L, R/C, boating, cars, etc.). **Model Airplane News** will award two free one-year subscriptions to be given by the club to outstanding junior members. So send your newsletter to **Model Airplane News**, Club of the Month Contest, 251 Danbury Rd., Wilton, CT 06897.

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